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It is interesting to try to ascertain the causes for such freedom and scope in the transferred uses of animal names. Primitive man must have been curious about all phenomena of nature. Probably nothing in his usual round of activities attracted and engrossed his attention so much as the multitudinous manifestations of animal life thronging the air, roaming the fields, and swimming the streams. Even had he not been curious, necessity, stern and inexorable, would soon have compelled him to form an acquaintance with them.

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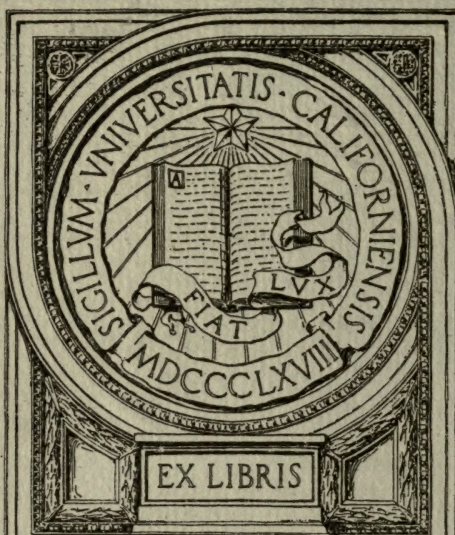
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FIGURATIVE USES OF ANIMAL NAMES IN LATIN AND THEIR APPLICATION TO MILITARY DEVICES

A STUDY IN SEMANTICS

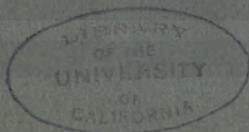
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EUGENE STOCK MCCARTNEY, A.B.

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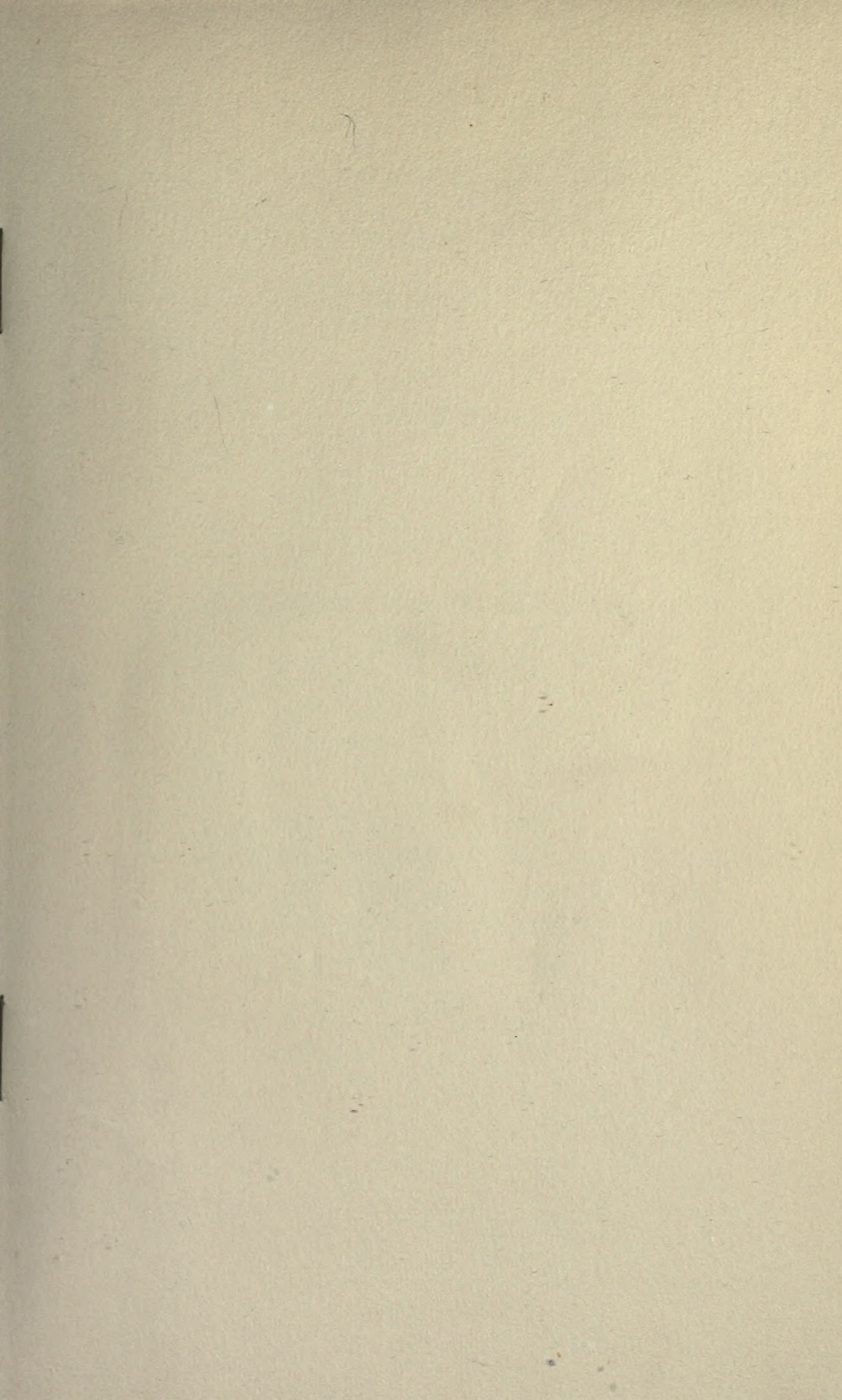
A THESIS

Presented to the Faculty of the Department of Philosophy of the
University of Pennsylvania, in Partial Fulfilment of
the Requirements for the Degree of
Doctor of Philosophy



PRESS OF
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In armorum generibus milites sumunt ab animalibus nomina.

(Serv. *Aen.* ix, 503.)

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PREFACE.

The writer first became interested in the subject of this thesis by trying to parallel for class-room purposes the not infrequent figurative uses of animal names in Caesar and Xenophon. The idea of approaching it seriously from the view-point of semantics was due to the conflicting testimonia veterum in regard to the reason for the transfer of the term *testudo* to the military device.

The introduction, being very general in character, is naturally not intended to be exhaustive.

For kindly criticism and suggestions, as well as for assistance in proof-reading, the writer takes pleasure in expressing his thanks to Professors J. C. Rolfe and W. B. McDaniel and Assistant Professors R. G. Kent and G. D. Hadzsits, of the University of Pennsylvania.

E. S. McC.

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¹ In addition to the books above listed, the various lexica have been consulted.

The abbreviations of Latin works and their authors are those of the *Thesaurus L. L.*, except that *Veg.* is used to refer to the military writer.

FIGURATIVE USES OF ANIMAL NAMES IN LATIN.

Of some seven hundred names of animals² found in Harper's Latin Lexicon, about one-third are used in significations more or less figurative. This seems a large proportion, but the list is far more imposing when we consider that metaphorically the names of animals are capable of more than one interpretation, attracting to themselves a train of kindred ideas and suggestions whereby language is progressively enriched, an enrichment to which there is hardly a limit. The list becomes even more impressive when we realize that from these names there are formed adjectives, verbs, and even adverbs. Furthermore, an animal name may become a prefix, as *βου-* and *ἵππο-* in Greek.³

Not content with representing the vices and virtues of human beings by animal names, writers of comedy and satire further ridiculed the acts of men by the use of verbs which were strictly appropriate to animals alone.⁴ Again, allusions to an animal may be present *in extenso* without any mention of the animal.⁵

A glance at Murray's New English Dictionary under the caption *dog, cat, horse*, etc., will reveal in some measure the extent of the field of this phenomenon in English.

² The word *animal* is used in the Latin sense.

³ Bulimum Graeci magnam famem dicunt, adsueta magnis et amplis rebus praeponere *βου-*, a magnitudine scilicet bovis. Hinc est, quod grandes pueros *βούπαιδας* appellant, et mariscam ficum *βούσυκον*, Paul. Fest. p. 32 Müll. Cf. Varro *Rust.* ii, 5, 4; also the English use of *horse, bull, elephant*, to denote hugeness, strength, loudness, coarseness, as seen in *horse-laugh, horse-nettle, horse-play, horse-ant, horse-sense, bull-frog, bull-fiddle, elephant-folio*.

⁴ Cf. Omnes . . . sibilent, Plaut. *Merc.* 407; Omnis plateas perreptavi, Plaut. *Amph.* 1011; Nostras aedis arietat, Plaut. *Truc.* 256.

⁵ Cf. Vergil's figure of winds chafing like steeds at the barriers, *Aen.* i, 52-63.

The citation of a few examples like *blackbird-brig*, *donkey-engine*, *alligator-wrench*, *caterpillar-traction-engine*, *grass-hopper-connecting-rod* will show the flexibility of the English language in the transfer of animal names to mechanical devices and contrivances. Its freedom in other fields is quite as pronounced.⁶

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suitable for domestication; and in making them docile and tractable, he had bitter trials and discouraging experiences.

The domestic animal was his friend, or even his kin. The tribal blood flowed in its veins. Even the god himself was at times an ox or a sheep. The slaughter of an ox was *buphonia*, or 'ox-murder.' The habit of slaughtering animals and eating flesh was considered a departure from the laws of primitive piety.¹⁷

His dependence upon the animal kingdom was continually becoming more varied, if not more pronounced, not merely as one of his sources of food supply and for draught purposes, but for the necessities, conveniences, weapons, and even the meager luxuries that could be produced from fur, bone, and hide.

Civilization advanced, man's horizon broadened, his mind unfolded, but still his life was closely connected with the animal kingdom. *Signa ex avibus*, *signa ex quadrupedibus*, and *auspicia pullaria* played an important part in his existence. Birds and beasts became, as it were, eponymous heroes.¹⁸ Vultures flying over seven low-lying hills determined the founder of an empire,¹⁹ the cackling of geese saved a city,²⁰ the *tripudium* of chickens influenced the conduct of the general,²¹ the quivering of entrails and the action of bird and beast decided policies of state.²² Animal sacrifices appeased the anger of heaven.

In countless ways human existence was linked with that of the animal kingdom, and thus it is not at all strange that animal names played so large a rôle in the development of man's linguistic resources.

¹⁷ Lecture viii, in W. Robertson Smith, *The Religion of the Semites*. Cf. Murray, *The Rise of the Greek Epic*, p. 59 sq. Cf. also Varro, *Rust.* ii, 5, 3: Hic (taurus) socius hominum in rustico opere et Cereris minister, ab hoc antiqui manus ita abstinere voluerunt, ut capite sanxerint si quis occidisset.

¹⁸ *Hirpini* from the guidance of the *hirpus* 'wolf,' Strabo v, 4, 12; *Picenum* from that of the *picus* 'woodpecker,' id. v, 4, 2.

¹⁹ Liv. i, 7, 1.

²⁰ Id. v, 47, 4.

²¹ Id. x, 40, 5-6.

²² Qui (rex Deiotarus) nihil umquam nisi auspicio gerit. Cic. *Div.* i, 15, 26.

Much homely wisdom and many shrewd observations on life were stored up in animal proverbs.²³ *Profert cornua vultur*,²⁴ 'the vulture grows horns,' represented the impossible; *piscari in aëre*,²⁵ 'to fish in air,' signified the useless; *lupo agnum eripere*,²⁶ 'to rescue the lamb from the wolf,' typified the difficult.

Dentes canini were used in eating; the door of a mistress was subjected to a vigorous *arietatio*; *senectus cervina* denoted longevity.

The farmer supported his vines with *cervi*, the architect planned a *testudo*, the surgeon operated with a *corvus*, the veterinarian treated a *ranula*, the soldier shot with a *scorpio*, the infantryman rallied round an *aquila*, an *ursa* roamed the heavens, the gambler threw a *canis*, the lover called his sweetheart *passer*, the botanist searched for a *dracontium*, the jeweler prized a *chelidonia gemma*. A new species of fish was observed, it grunted, it became the *porcus marinus*; the unfamiliar elephant was called *Luca bovis*;²⁷ *camelopardalis*²⁸ visualized prominent phases of two animals better known.

Christianity made its advent. *Agnus* signified the Master, *Draco*, the Devil, *phoenix*, the resurrection, *ἰχθὺς*, the new religion.

The absence of the figurative and derived uses of animal names would seriously impair the resources of a language. Each animal has some distinguishing trait, so that the satirist is provided with a full quiver from which to shoot the shafts of ridicule, the comic poet with a perennial fount from which to draw a supply of humor. A slight index of the loss incident to the exclusion from Latin of derived uses of animal names may be obtained by trying

²³ Cf. Genthe, *Epistula de proverbiis Romanorum ad animalium naturam pertinentibus*; Sylvio Köhler, *Das Tierleben im Sprichwort der Griechen und Römer*; A. Otto, *Die Sprichwörter und sprichwörtlichen Redensarten der Römer, Das Tierreich*, p. 384 sqq.

²⁴ Claud. xviii, 352.

²⁵ Plaut. *Asin.* 99.

²⁶ Plaut. *Poen.* 776.

²⁷ Naevius ap. Varro, *Ling.* vii, 39.

²⁸ . . . quod erat figura ut camelus, maculis ut panthera; Varro, *Ling.* v, 100.

to imagine Plautus and Terence,²⁹ or Horace, without them.

The possibilities of mirth-making from this source were keenly appreciated by writers of the Old Comedy in Greece, as the citation of a few titles will show; e. g., the *Birds* and *Frogs* of Magnes, the *Beasts* of Crates, the *Goats* of Eupolis, the *Fishes* of Archippus, the *Snakes* of Menippus, the *Nightingales* of Cantharus, the *Ants* of Plato, the *Wasps* of Aristophanes, and the like.

That such transferred uses are popular in origin is apparent without demonstration. Accordingly we are not surprised to learn from Servius that the soldiers were fond of animal names and were in the habit of coining them for military weapons. Commenting on the military *testudo*, he says:³⁰ in armorum generibus milites sumunt ab animalibus nomina, ut aries. That the names are non-technical is attested by Vegetius:³¹ testudines, musculos, arietes, vineas, ut appellat, 'as the laity say.'

There can be no doubt that the list of such names was far larger than the number now extant. This can easily be inferred from the opposition to those that did manage to force their way into good standing. How many names of this kind perished under the censorship of the technical writers and purists who had the *summa potestas* over them, can only be conjectured.

Besides this source of loss, some words have disappeared through the destruction of the works in which they were embodied. The preservation of our clearest passage on the *ericius*,³² cheval-de-frise, is due solely to antiquarian curiosity.

That Tacitus³³ and Plutarch regarded such names as un-

²⁹ Cf. E. F. Wortmann, *De comparationibus Plautinis et Terrentianis ad animalia spectantibus*.

³⁰ Serv. *Aen.* ix, 503. Quoted in Isid. *Orig.* xviii, 12, 6.

³¹ Veg. ii, 25.

³² Sallust ap. Nonius, 555, M.

³³ Although Tacitus describes a large number of sieges and military engagements, *testudo* is the only animal name that he uses for the various devices. Though *cuneus* is frequent, *caput porci* never appears. Such passages as tormentis hastas, saxa, et faces ingerere (*Ann.* ii, 81), must include the *onager* and *scorpio*. Perhaps vague expressions like tormentis servorum patefacta sunt flagitia (*Ann.* iii, 23) refer to the *eculeus*. In *Hist.*

dignified, may be inferred from their infrequent or guarded use of them. Signs of the struggle that such words had, to attain recognition and standing, face us on every hand. While the citation of a few examples may not be convincing, the multiplication of apologetic expressions by various authors affords conclusive proof of the opposition to them.

About four centuries after Xenophon used *κριός* and *χελώνη* in the military sense, Diodorus feels it incumbent upon himself to apologize for their use, *τούς τε ὀνομαζομένους κριοὺς καὶ χελώνας*,³⁴ 'the so-called *rams* and *tortoises*.'

Even Vegetius, who is fond of accounting for the transfer of some names, is very reluctant to employ others. *Lupus* he regards as distinctly vulgar and common; *ferreos harpagonas, quos lupos vocant*;³⁵ and *ferrum quem lupum vocant*.³⁶ In both instances he disclaims responsibility for its use. *Murex*, a term lying ready to hand, he utterly disdains, crossing the Adriatic for *tribulus*, *τρίβολος*.

When *murex* is used by other authors,³⁷ the boldness of the metaphor is tempered by *ferreus*. The adjective, however, may be necessary, in this instance, for clearness.

Grus 'crane' must have been in frequent use (see p. 33), but owing to the vulgarity of the term, good authors avoided it. Vitruvius tells us that the *corvus demolitor* was sometimes vulgarly dubbed 'the crane.'³⁸

Plutarch, in describing Archimedes's inventions at Syracuse, speaks of machines with mouths like those of cranes, *στόμασιν εἰκασμένοις γεράνων*,³⁹ probably not because the simile was on the way to a metaphor, but rather from a desire to be somewhat non-committal. Athenaeus speaks guardedly of a different *crane*, *ἡ δὴ λεγομένη γέρανος*,⁴⁰

iv, 30, the military *grus* (see *grus*, p. 34) is evidently meant. Even in the account of the siege of Jerusalem *aries* is not mentioned. By means of *tormentum, machina, machinamentum*, and various colorless expressions, Tacitus avoids the use of the convenient animal names.

³⁴ Diod. xii, 28, 3.

³⁵ Veg. ii, 25.

³⁶ Id. iv, 23.

³⁷ Val. Max. iii, 7, 2; Curt. iv, 13, 36.

³⁸ Vitr. x, 13, 4.

³⁹ Plut. *Marcellus*, 15.

⁴⁰ Math. Vett. p. 10.

'the so-called crane.' Athenaeus, the Deipnosophist, refers to the same contrivances of Archimedes as *κόρακες σιδηροί*,⁴¹ softening the expression by an adjective. Tzetzes, however, refuses to lower the tone of his poetic description by either *κόραξ* or *γέρανος*.⁴² Polybius displays similar reluctance in describing the same machines.⁴³

Ammianus and Vegetius show that *cuneus* is technical for the wedge-shaped formation of battle, while *caput porcinum* and *caput porci* are naïve military terms: *desinente in angustum fronte, quem habitum caput porci simplicitas militaris appellat*;⁴⁴ and, *Quam rem (cuneum) milites nominant caput porcinum*.⁴⁵

ὄναγρος, says Lydus, is banale: *καταπέλτης δέ ἐστιν εἶδος ἐλεπόλεως, καλεῖται δὲ τῷ πλήθει ὄναγρος*.⁴⁶

Philon says that *σκορπίοι* is vulgar for the technical *εὐθύτονα*. *ἃ τινες καὶ σκορπίους καλοῦσιν*.⁴⁷

The *κριοί* of Procopius may not be merely explanatory. He seems to imply that it is colloquial: *μηχανὰς αὖ κριοὶ καλοῦνται*.⁴⁸

Ammianus expresses his disapproval of the new-fangled term for the old *scorpio*: *scorpio . . . cui etiam onagri vocabulum indidit aetas novella*.⁴⁹ A second time he seems to lament the usage of his day: *Scorpionis . . . quem appellant nunc onagram*.⁵⁰ Vegetius uses the generalizing third person in speaking of the *cuniculus*: *genus oppugnationum . . . quod cuniculum vocant*.⁵¹

Festus says that the astronomical *suculae* is a transfer of an age inelegant in speech: *stellas . . . quas appellarunt a pluvia hyadas Graeci. Nostri forsitan existimantes a subus dici saeculo parum eloquenti, dixerunt eas suculas*.⁵²

Even post-classic Latin, with all its corruptions and barbarisms, did not fail to recognize the humble origin and vulgarity of some of these terms:

Scrophæ. Machinas . . . quas vulgo Scrophas appellant.

⁴¹ Ath. p. 208 d.

⁴² Tzet. *Hist.* ii, 35.

⁴³ Polyb. viii, 8, 1 sq.

⁴⁴ Amm. xvii, 13, 9.

⁴⁵ Veg. iii, 19.

⁴⁶ Lydus, *De Mag.* i, 46.

⁴⁷ Math. Vett. p. 122.

⁴⁸ Procop. *B. G.* i, 21.

⁴⁹ Amm. xxiii, 4, 7.

⁵⁰ Id. xxiii, 4, 4.

⁵¹ Veg. iv, 24.

⁵² Fest. p. 301 Müll.

Catus. Machinam quandam parvam, quae lingua vulgari Catus dicitur.⁵³

The accumulation of these various quasi-apologetic expressions shows how rigorous was the opposition to transferred animal names on the part of the purists. While the prejudice against their use was never entirely eradicated, the convenience of the terms and their picturesqueness enabled them to escape total ostracism.

In the following pages an effort will be made to trace the reasons for the transfer of animal names to military machines and devices, both offensive and defensive.⁵⁴ These animal terms appealed so strongly⁵⁵ to the Romans, especially the later technical writers, that they deemed it worth while to stop to explain the transfer, in some instances even hazarding a guess as to the reason for it.

Such a penchant did the Roman have for etymologizing, that at times we find three or four reasons adduced, a few of them not without a grain of humor. Our present task will be to sift their testimony, in an endeavor to discover the distinguishing shape, trait, habit, or characteristic that caused the transfer. The change from the literal to the figurative is seldom due to a resemblance in more than one particular.

Apropos of this Bréal says: Il n'est pas douteux que le langage désigne les choses d'une façon incomplète et inexacte.—Mais si je prends un être réel, un objet existant dans la nature, il sera impossible au langage de faire entrer dans le mot toutes les notions que cet être ou cet objet éveille dans l'esprit. Force est au langage de choisir. Entre toutes les notions, le langage en choisit une seule: il crée ainsi un nom qui ne tarde pas à devenir un signe.⁵⁶

Consequently, in order to effect a transfer from one

⁵³ Quoted by Du Cange, s. vv.

⁵⁴ Cf. in Eng. *basilisk, cat, crows' feet, culverin, dogs of war, ram, torpedo*, etc.

⁵⁵ The appeal of such figures is shown by the grim 'joke of Black Agnes of Dunbar, when she had smashed the penthouse and saw its occupants scampering away from beneath: "Behold, the English sow has farrowed." Oman, *A History of the Art of War*, p. 133.

⁵⁶ *Essai de Sémantique*, pp. 191, 192.

object to another, it is essential for at least one property to be the common possession of each. For instance, a metal is unstable, Mercury is ever on the wing. The similarity, as seen in the continual motion of both, causes an easy transfer of the god's name to the metal.

The points of contact between the animals and the military instruments to which the animal names are applied will be found for the most part in two things: first, in the shape, generally of a part of the body, as the horn, mandibles, jaws, shell; secondly, in actions, as kicking, biting, burrowing.⁵⁷

**ARIES, GK. *κρίως* RAM; *transf.*, A BATTERING
INSTRUMENT.**

As military machines, like all mechanisms, must go through a long process of evolution, it is evident without demonstration that the principle of the battering instrument was recognized and employed before the term *κρίως* (*aries*) was applied to it.⁵⁸ The question before us, then, is to decide whether the device lived a rather anonymous sort of existence under the general term *μηχανή* until one end was finally shaped to resemble a ram's head; or whether the similarity in the method of attack inspired the use of the term *κρίως*, this in turn, combined perhaps with the use of *κεφαλή* for the end of the beam, suggesting the fashioning of the ram's head.

An explanation of the transfer in meaning of *aries* would seem like 'carrying coals to Newcastle,' were it not for the fact that late Roman writers specifically attribute the figurative use to the shape of the end of the beam.

In one passage Ammianus implies this: *cum iam . . . aries*

⁵⁷ In the following pages some citations descriptive of animal life will be made, in order to give a Greek or Roman background for the change, or to show how similar were the words applied to the animals and the machines. Some such passages will be of a date later than the transfer, though even these may reflect the views of authors far earlier, especially in the case of the *Natural History* of Pliny and the *Lexicon* of Suidas.

⁵⁸ Thuc. ii, 76, 4, speaks of a battering device under the title *μβολή*. Apparently the first use of the term *κρίως* for the instrument is in Xen. *Cyr.* vii, 4, 1.

...adventaret, prominentem eius ferream frontem, quae re vera formam effingit arietis.⁵⁹

Later on, the same author expresses himself in very positive terms: abies ...arietis efficiens prominulam speciem, quae forma huic machinamento vocabulum indidit.

In Vitruvius is found the statement that the *ram* was invented by the Carthaginians at the siege of Gades. Vitruvius is indebted to Athenaeus,⁶¹ who in turn has followed an older military writer. On their authority he states that the Carthaginians wished to raze a fortress which they had captured. Having no suitable implements, they improvised a *ram* from a piece of timber, and by means of this makeshift device, they managed to demolish the walls:

Primum ad oppugnationes aries sic inventus memoratur esse. Carthaginienses ad Gades oppugnandas castra posuerunt; cum autem castellum ante cepissent, id demoliri sunt conati. Posteaquam non habuerunt ad demolitionem feramenta, sumpserunt tignum idque manibus sustinentes, capiteque eius summum murum continenter pulsantes, summos lapidum ordines deiciebant, et ita gradatim ex ordine totam communionem dissipaverunt.⁶²

As the siege referred to is the one conducted by Hamilcar immediately after the First Punic War, this cannot be the first application of the battering-principle, or the first use of the term *aries*. Hence it is unwarranted to claim that this impromptu device, constructed too quickly to permit of fashioning a head, secured its name from the resemblance to the butting of the ram.

Plutarch tells⁶³ of some machines that Pericles introduced at the siege of Samos in 440 B. C. Diodorus, a contemporary of Caesar and Augustus, describes them as 'so-called *rams* and *tortoises*,' τοὺς τε ὀνομαζομένους κριοὺς καὶ χελώνας.⁶⁴ The phraseology means that Diodorus is recasting, somewhat reluctantly, in terms current in his own

⁵⁹ Amm. xx, 11, 15.

⁶⁰ Amm. xxiii, 4, 8.

⁶¹ Math. Vett. p. 3.

⁶² Vitruv. x, 13, 1.

⁶³ Plut. Pericles 27.

⁶⁴ Diod. xii, 28, 3.

day, accounts of machines that received definite names subsequent to the time of their introduction.

No mention is made in Greek literature of the formal application of the battering principle before Thucydides's description of the battle of Plataea. Here, however, the device masqueraded under the title ἐμβολή. It was entirely of wood, for it split and was rendered useless on striking the wall: ἡ δὲ (μηχανή) ῥύμη ἐμπίπτουσα ἀπεκαύλιζε τὸ προέχον τῆς ἐμβολῆς. Μετὰ δὲ τοῦτο οἱ Πελοποννήσιοι ὡς αἱ τε μηχαναὶ οὐδὲν ὠφέλουν. . . .⁶⁵

The first use of the term κριός in a military sense is a casual reference in Xenophon⁶⁶ with regard to Cyrus's construction of rams and other machines. Hesychius in his Lexicon defines the term as used by Xenophon, explaining it by ῥόπαλον πολιορκητικόν, which is clearly a blunt-shaped piece of timber, a club of Hercules on a large scale. No mention is made of any likeness to a ram's head.

Since his readers were familiar with the ram-headed beam, Hesychius, as an antiquarian, takes occasion to explain the unusual, namely the meaning of κριός before its end had been ornamented with the head. In a brief explanation of this character, Hesychius would not have refrained from using the concise κριοκέφαλος, or κριοειδής, had the facts justified it. With regard to χελώνη, which maintained its general character throughout, he is content with μηχανήμα.

From the first of two explanations of Suidas we can gather up the threads of the development, filling in the details:

κριός. τὸ μηχανήμα τὸ πολιορκητικόν. καλεῖται δὲ οὕτως ὅτι προσπίπτει τε ῥύμη καὶ πάλιν ἐπανέρχεται, καὶ τοῦτο συνεχῶς ὥσπερ μαχόμενον ποιεῖ. ἔστι δὲ κεραία μεγάλη κριοειδής, καὶ αὐτῆς τὸ προέχον τῆς ἐμβολῆς σεσιδήρωται ἐπὶ πολὺ, ὥστε μῆτε ἀποκαυλίζεσθαι, μῆτε ἐμπίπρασθαι.

Here we have the cause of the transfer. The swing of the machine was like the onrush of the animal and its re-

⁶⁵ Thuc. ii, 76, 4 sq.

⁶⁶ Xen. Cyr. vii, 4, 1.

peated attacks. The similarity was too obvious to escape the notice of men whose boyhood had been spent in grazing districts. In their everyday economy, the butting with the formidable brow had been very much in evidence. In the excitement of the siege a soldier, struck by the likeness, called the device *κριός* and its name was fixed forever.

To prevent the device from being set on fire or shattered, as in the case mentioned by Thucydides, it was encased at the *ἐμβολή* with iron. This, to increase its effectiveness, was sharpened. The name *κριός*, assisted by the term *κεφαλή* already applied to the end of the beam, evidently suggested the fashioning of the ram's head.

In his alternative explanation, Suidas, following Josephus,⁶⁷ states that it was the extension that was shaped to resemble the head of the animal, and that this gave rise to the name: *κριός. δοκὸς ὑπερμεγέθους ἰσθῶ νηὸς παραπλησίᾳ. ἐστόμωται δὲ παχεὶ σιδήρῳ κατ' ἄκρον ἐς κριοῦ προτομήν, ἀφ' οὗ καὶ καλεῖται τετυπωμένος.*

This derivation is impossible, since the *κριός* of Xenophon's times was blunt, not pointed, nor carefully chipped.

In Latin literature, there are found three conflicting attempts to account for the transfer. Hegesippus (for in such guise does Josephus masquerade in the Latin translation) attributes the change, as did Ammianus, to the shape of the end of the beam, in spite of the fact that in his description there is but a single horn and that at the end: *Deiectus eo Vespasianus rursus ad expugnandam urbem accenditur, omnem exercitum congregat, machinis murum quatit, pulsat ariete. Nomen hoc species dedit eo quod validae ac nodosae arboris caput vestitur eoque ut frons aries praetexitur, quae obductis laminis turgescit et prominet e medio eius quasi cornus procedit ferri solidioris.*⁶⁸

Varro too was under the impression that the transfer was due to similarity in shape, as the context shows (see quotation p. 39).

Vegetius has given us a choice of alternatives, ascribing

⁶⁷ Joseph. *B. J.* iii, 7, 19.

⁶⁸ Heges. iii, 11. Cf. Joseph. *B. J.* iii, 7, 19. Isid. in *Orig.* xviii, 11, 1, is indebted to these passages.

the transfer to the resemblance between the hard head of the animal and the stout end of the beam; or, to the similarity between the butting and the swing of the machine, the ram stepping back to butt with increased power, just as the beam is drawn back to acquire momentum and force; appellatur aries, vel quod habet durissimam frontem, qua subruit muros, vel quod more arietum retrocedit, ut cum impetu vehementius feriat.⁶⁹

The first derivation can be disregarded, since the end of the original *κριός* was comparatively soft, being of wood, as Hesychius's definition of Xenophon's *κριός* implies. *Durissimam* evidently refers to the iron protection of later times; cf. *ferream frontem* p. 11.

The second alternative of Vegetius is, of course, the only tenable reason for the transfer. The late Greek writer Procopius,⁷⁰ supports this view, speaking with the fullest assurance: ἡ δὲ (δοκὸς) συχνὰ ἐμβαλλομένη κατασείσαι τε ὅπη προσπίπτει καὶ διελεῖν ῥᾶστα ὅλα τέ ἐστι, καὶ ἀπ' αὐτοῦ τὴν ἐπωνυμίαν ταύτην ἡ μηχανὴ ἔχει, ἐπεὶ, τῆς δοκοῦ ταύτης ἡ ἐμβολὴ προὔχουσα πλήσσειν ὅπου παρατύχοι, καθάπερ τῶν προβάτων τὰ ἄρρενα, εἴωθε. The beam by continued battering knocks down and razes with ease whatever it encounters, such is its efficiency, and from this characteristic the machine gets its derived name, since the projecting end has the habit of working havoc with obstructions, in the manner of the male sheep.

Echoes of the real origin of the transfer can be detected in the reluctance of some authors to justify the derived use of *aries* by the projecting point. Vitruvius in 10, 15, avoids *cornu* by *rostrum*. Hegesippus in describing 'that famous ram of Vespasian,' apologizes for *cornu* by *quasi: e medio arietis* (arietis) quasi cornu procedit ferri solidioris.⁷¹

That the heads were at times made separately is shown by Josephus. He tells how when the head of a ram was broken off by a stone, a defender ran out and picked it up: οὗτος (Ἐλεάζαρος) ὑπερμεγέθη πέτραν ἀράμενος ἀφίησιν ἀπὸ

⁶⁹ Veg. iv, 14.

⁷⁰ Procop. B. G. i, 21.

⁷¹ Heges. B. J. iii, 11.

τοῦ τεύχους ἐπὶ τὴν ἐλέπολιν μετὰ τοσαύτης βίας ὥστ' ἀπορράξαι τὴν κεφαλὴν τοῦ μηχανήματος, ἣν δὴ καὶ καταπηδήσας ἐκ μέσων αἴρεται τῶν πολεμίων, καὶ μετὰ πολλῆς ἀδείας ἐπὶ τὸ τεῖχος ἀνέφερε.⁷²

It is the later life-like heads, with ornamental horns at the side, as seen in the sculptures on the column of Trajan, that caused the confusion among the Romans in regard to the transfer of meaning.

On *a priori* grounds one would naturally infer that it was the butting that gave rise to the figurative use of aries. In the animal there are two aspects, and only two, that stand out conspicuously, the peculiar spiral horn, and an innate fondness for removing obstructions, animate or inanimate, with his head. The contour of the horn has enriched us with the *κριός* of architecture and ichthyology.⁷³ A convoluted horn, like that of the ram, is however absolutely useless for battering. Had the horn been the basis of comparison, *bos* would have been far more appropriate as the name of the machine.

A store of proverbs and allusions, emphasizing the butting propensity of the ram, shows how easy must have been the transition to *aries* 'the buttress' and *aries*, 'the battering device.'

Plautus makes excellent use of this characteristic of the ram: *Arietes truces nos erimus, iam in vos incursabimus*,⁷⁴ 'We shall turn into fierce rams and shall soon be rushing upon you.'

Suidas informs us that *κριὸς τροφεία ἀπέτισε*, 'the ram makes requital for his keep,' is a proverb for ingratitude: *παροιμία ἐπὶ τῶν ἀχαρίστων. καὶ γὰρ τοῖς κριοῖς ἐκτραφέντας φασὶ κυρίττειν τοὺς θρεψαμένους, ὃ ἐστὶ πλῆττειν.*

κριοὺς ἐκγεννᾶν τέκνα, 'to beget children that turn on you like rams,' has the same trait in mind.

κριοῦ διακονία, 'the tender mercies of the ram' is, as Hesychius shows with clever repartee, a classical analogue to the serpent's tooth of the Bible, to denote a filial ingrate. For

⁷² Joseph. *B. J.* iii, 7, 21.

⁷³ *Aries* is not used for the prow of a ship.

⁷⁴ Plaut. *Bacch.* 1148.

the astragals,⁷⁵ or figs, fed by its keeper, the ram returns astragals far different, i. e., a vigorous impact. The conversation between the ram and its master may be represented as follows: 'I will make you a present in pulse if things turn out well.' And the ram rebutted, 'I'll present you with my strongest impulse.'

κριοῦ διακονία. ὅταν προστάσσωμεν παιδία διακονῆσαι, λέγομεν. δώσω σοι εἰ τύχοι ἀστραγάλους, ἢ ἰσχάδας. καὶ ὁ κριὸς οὖν εἶπε, τὸν κρείττονα καὶ τοῦ ἀστραγάλου σοι δώσω.

Arietilli in Petronius⁷⁶ aptly describes the 'rambunctious.'

It is a very striking and interesting coincidence that the Semitic peoples used their words for ram, *kar* among the Hebrews, and *kabš* among the Arabians, to designate the mechanical principle. The early Semitic *rams* were not equipped with ram-like heads. The monuments show ends like those of spears, or truncated cones made slightly concave.⁷⁷

The parallel does not end here, for the ram followed the same course of development among the Semitic as among the Graeco-Italic peoples. "The besieged, if unable to displace the battering ram sought to destroy it by fire, and threw lighted torches, or fire-brands, upon it."⁷⁸ This necessitated an iron protection for the end.

In the days of the Christians, we hear of enormous rams' heads supplied with their full quota of horns. Dans le récit du siège de Saint-Jean d'Acre par les Chrétiens, tel que nous le donne l'historien Isfahani, on trouve de longs détails sur un bélier (*kabš*), que les assailants avaient construit pour battre les murs de la place, et qui devait son nom à une énorme tête surmonté de deux cornes.⁷⁹

The independent application among both Semites and

⁷⁵ Astragal, one of the vertebrae, especially of the neck; a leguminous plant.

⁷⁶ Petron. 39.

⁷⁷ See plates in *Nineveh and its Remains*, A. H. Layard, vol. ii, pp. 368, 369. Egyptian monuments also show spear-like ends on their *rams*. See plate in vol. i, p. 242, of S. Birch's revision of *The Ancient Egyptians*, by J. G. Wilkinson.

⁷⁸ Layard, id. p. 371.

⁷⁹ R. Dozy, *Supplément aux Dictionnaires Arabes*, s. v.

Greeks of the term *ram* to an instrument, no part of which was originally like the animal, points conclusively to the butting as the true reason for the transfer.

In English, the term, *ram*, aside from its military and naval applications, is used to designate several devices for battering, crushing, butting, or driving by impact. Among them may be mentioned the following as found in *The Century Dictionary*:

1. The weight or *monkey* of a pile-driving machine.
2. The piston in the large cylinder of a hydraulic press.
3. A hooped spar used in ship-building for removing timbers by a jolting blow on the end.
4. In metal working, a steam-hammer used in forming a bloom.
5. An hydraulic lifting-machine.

In no case is there a use of the term *ram* that is derived from the shape of the device.

EQUUS, HORSE; *transf.*, A BATTERING INSTRUMENT(?).

The statement of Pliny⁸⁰ that the *horse* as a battering instrument was invented at Troy, *equum* (qui nunc aries appellatur) in muralibus machinis, Epeum ad Troiam (invenisse dicunt), is merely tradition, going back ultimately to the story of the *Wooden Horse* in the *Odyssey*:

ἵππου κόσμον ἄεισον
δουρατέου, τὸν Ἐπειὸς ἐποίησεν σὺν Ἀθήνῃ.⁸¹

The idea of the *aries* is due to a critical spirit such as Pausanias later manifested in describing the so-called *Wooden Horse* at Athens. Any person of common sense, as he implies, would know that the Trojans were not such fools as to do what the story ascribes to them, and that in reality Epeus's invention was a wall-breaking device: ἵππος δὲ ὁ καλούμενος δούρειος, ἀνάκειται χαλκοῦς. καὶ ὅτι μὲν τὸ ποίημα τὸ Ἐπειοῦ μηχανήμα ἦν ἐς διάλυσιν τοῦ τείχους, οἶδεν ὅστις μὴ πᾶσαν ἐπιφέρει τοῖς Φρυξίν εὐήθειαν· λέγεται δὲ ἔς τε ἐκείνον τὸν ἵππον ὡς τῶν Ἑλλήνων ἔνδον ἔχοι τοὺς ἀρίστους, . . .⁸²

⁸⁰ Plin. *Nat.* vii, 56, 57, (202). Cf. also Varro *L. L.* vii, 38.

⁸¹ Od. viii, 492-493.

⁸² Paus. i, 23, 10.

Propertius had long before expressed himself in almost the same vein as Pausanias:

Nam quis equo pulsas abiegnō nosceret arces, . . .⁸³

We may conclude then that the story of a military *horse* owes its existence only to the long association of the breach in the walls and the admission of the steed, as if the latter had forced an entrance.

Professor Murray suggests that "the stratagem of the Wooden Horse may represent only a brilliant afterthought of what ought to have been done," or, if real, "may refer to a siege tower of the Assyrian type."⁸⁴

Consideration of Pliny's statement may be dismissed with the criticism in Daremberg et Saglio: On ne trouve, ni dans Homère, ni autre part, rien qui justifie cette étrange interprétation de la légende.⁸⁵

CAPREOLI, WILD GOATS; *transf.*, THE GABLE BEAMS OF THE TESTUDO AND MUSCULUS, ALSO THE BRACES IN THE CATAPULT AND SCORPION.

Caesar speaks of the beams of the *musculus* joined by the gently sloping *capreoli*: Has (trabes) inter se capreolis molli fastigio coniungunt.⁸⁶

An instance of the use of the term in connection with the *testudo* is found in Vitruvius: Supra trabes (testudinis) conlocentur capreoli cardinibus alius in alium conclusi.⁸⁷

Columella mentions the *capreoli* as a two-pronged weeding instrument: capreolis, quod genus bicornis feramenti est, terra commoveatur.⁸⁸ Although in this case the figure is that of inverted horns, it seems clear that the metaphor in the structural *capreoli* is not from the horns of a single goat, but from the interlocked horns of two

⁸³ Prop. iii, 1, 25.

⁸⁴ G. Murray, *The Rise of the Greek Epic*, p. 35.

⁸⁵ Daremberg et Saglio, s. v. *aries*. The writer of the article on *oppugnatio* prefers Pausanias's rationalistic view.

⁸⁶ Caes. *Civ.* ii, 10, 3.

⁸⁷ Vitruv. x, 14, 2. In x, 10, 4, Vitruvius speaks of the *capreoli* in the catapult.

⁸⁸ Colum. xi, 3, 46.

animals. A hint of this might possibly be drawn from Vitruvius's *capreolorum compactiones*.⁸⁹

Isidore's words seem to point conclusively to this idea, for he says that rafters are called *luctantes* owing to their supporting each other in the fashion of contestants: *Luctantes dicuntur, quod erecti invicem se teneant more luctantium*.⁹⁰ This obviates the necessity of making the figure that of inverted horns, since *luctantium* is not restricted to human beings. Animals akin to the *capreoli* are given to fighting with horns interlocked:

Inter se adversis luctantur cornibus haedi.⁹¹

In *capreoli*, then, the figure seems to be drawn from the position of the horns of two struggling animals.

TESTUDO, GK. *χελώνη*, A TORTOISE; *transf.*,
A SHED-LIKE PROTECTION USED BY STORM-
ING PARTIES IN SIEGE OPERATIONS.

Three reasons are assigned or implied for the transfer of the term.

1. Resemblances between the appearances and disappearances of the end of the *ram* beneath the *testudo*, and the sticking out and withdrawing of the head of the animal.
2. Similarity in the manner of deflecting objects.
3. Likeness in shape.

Vegetius has adduced a reason, colored with a little unconscious humor, for the transfer of the animal name *testudo* to the military device. With the *testudo arietaria* (see p. 24) in mind, he compares the constant sticking out and withdrawing of the head of the animal to the extension and withdrawal of the ram-headed beam within its shelter: *Testudo a similitudine verae testudinis vocabulum sumpsit, quia, sicut illa modo reducit modo proserit caput, ita machinamentum interdum reducit trabem, interdum exerit, ut fortius caedat*.⁹²

This reason for the transfer appealed so strongly to Vegetius that he went astray in his natural history in rep-

⁸⁹ Vitr. x, 15, 3.

⁹⁰ Isid. *Orig.* xix, 19, 6.

⁹¹ Verg. *Georg.* ii, 526.

⁹² Veg. iv, 14.

resenting the tortoise as repeatedly sticking forth his head. As later quotations will show, the tortoise keeps its head within its shell in times of danger.

Vegetius's derivation is impossible because it implies that the military *testudo* was invented to shelter the *ram* and the men working it. The first use of the term *χελώνη* for the device is in Xenophon's *χελώνη ξυλίνη*,⁹³ where it is merely a covering for a trench.

The very relation of the adjective to the noun in *χελῶναι κριοφόροι*,⁹⁴ *tortoise-carrying rams*, shows that *χελώνη* was a general term for the military device, and that the use of *χελώνη*, both name and machine, in connection with *κριός* was later than both uses of *χελώνη* alone. In other words, the *χελώνη* had already been named before the introduction into it of the *κριός*, whose appearances and disappearances recalled to Vegetius the actions of a tortoise in extending and drawing back its head under its shell.

There remain to be considered as a basis of the transfer two other causes, which at first glance appear to be indissolubly linked. Was it the similarity in shape, or in the manner of deflecting objects, that led to the adoption of the name? The Greek and Roman authors are almost unanimous in supporting the latter view.

In the first use of *χελώνη* in Greek, Xenophon states that 'a wooden tortoise' was placed upon a trench to keep it from being filled with brush and stones: *ὥς δ' ἐκ τοῦ τεύχους ἐκθέοντες πολλάκις ἐνέβαλον εἰς τὸ ὄρυγμα καὶ ξύλα καὶ λίθους ποιησάμενος αὐτὴν χελώνην ξυλίνην ἐπέστησεν ἐπὶ τῇ φρεατίᾳ*.⁹⁵

Vitruvius says that the *testudo* was devised to afford protection to the men manipulating the *ram*: *uti tutiores essent qui in ea machinatione ad pulsandum murum essent collocati*.⁹⁶

⁹³ Xen. *Hell.* iii, 1, 7.

⁹⁴ The adjective *κριοφόροι* (*arietariae*), serves merely to differentiate this class of *χελῶναι* (*testudines*) from others that appeared as advances were made in *testudo* construction: e. g. *διωρυκτρίδες* (*fossiciae*); *γέρροχελῶναι* (*craticiae*); *χωστρίδες* (*aggesticiae*). Math. Vett. pp. 14, 99.

⁹⁵ Xen. *Hell.* iii, 1, 7.

⁹⁶ Vit. x, 13, 2.

In Athenaeus there appears the same idea. He advises the placing of *wooden tortoises* in front of the combatants in order to minimize their danger: *πρὸς δὲ τῶν κινδυνευόντων στρατιωτῶν προσφερέσθισαν γερρόρχελῶναι ὡς πλησίαι, ἵνα εὐχερῶς ἐντεῦθεν ἐκπηδῶντες κινδυνεύσωσιν*.⁹⁷

In all of these passages, the idea of protection stands forth very prominently. This same aspect is just as pronounced in descriptions of the animal.

Livy remarks that the tortoise, when entirely enclosed within its shell, is safe from all danger: *testudinem, ubi collecta in suum tegumen est, tutam ad omnes ictus video esse; ubi exserit partis aliquas, quodcumque nudavit, obnoxium atque infirmum habere*.⁹⁸

Phaedrus has two lines to the same effect:

Quae (testudo) cum abdidisset cornea corpus domo
Nec ullo pacto laedi posset condita . . .⁹⁹

Aristophanes gives a vivid picture of the strength of the tortoise-shell and the protection afforded by it:

ὦ χελῶναι μακάριαι τοῦ δέρματος,
καὶ τρισμακάριαι τοῦ 'πὶ ταῖς πλευραῖς τέγους.
ὥς εὖ κατηρέψασθε καὶ νουβυστικῶς
κεράμφω τὸ νῶτον ὥστε τὰς πληγὰς στέγειν.¹⁰⁰

'You turtles, thank your stars for your shell,
Yes, thank them thrice for the roof on your pelt.
How shrewdly you've covered your back and how well
With tiles that save you from many a welt!'

In the last six quotations, we see the same idea emphasized—the ability both of the animal and of the contrivance to secure protection from blows and missiles.

It is obvious that the tortoise shell is protective because of its shape—in other words the relation of the last two possibilities is that of cause and effect. The transition from one idea to the other is gradual and unconscious.

An illustration of the process by which the two ideas were

⁹⁷ Math. Vett. p. 98.

⁹⁸ Liv. xxxvi, 32.

⁹⁹ Phaedr. ii, 6, 5-6.

¹⁰⁰ Ar. *Vesp.* 1292 sq.

confused can be obtained from the descriptions of the *testudo* of shields, which was distinctively and exclusively a Roman military device. Ammianus, after picturing the three rows of shields of different level, likens the formation to a vaulted structure. The result of this shape is, that stones and other missiles are deflected as showers of rain are by a roof. The word *testudo* is not here mentioned, but the thing that appealed to the writer as most important was the shape: *Densetis cohaerentes supra capita scutis, primi transtris instabant armati, alii post hos semet curvantes humiliter, tertiis gradatim inclinatis summis, ita ut novissimi suffraginibus insidentes formam aedificii fornicati monstrarent. Quod machinae genus contra murales pugnas ideo figuratur hac specie, ut missilium ictus atque saxorum per decursus cadentium labiles, instar imbrium evanescant.*¹⁰¹

Livy,¹⁰² after an account of the *testudo* made of shields, compares the sloping sides to the roofs of buildings, and then goes on to state the result: *fastigatam, sicut tecta aedificiorum sunt, testudinem faciebant... ita nec ipsos tela ex muro missa subeuntes laeserunt, et testudini iniecta imbris in modum lubrico fastigio innoxia ad imum labebantur.*

The last two citations, while by no means conclusive in themselves, are very significant when we recall that all the other transferred meanings of *testudo*, except in proverbs, are due to a similarity in shape. Among these are the architectural *testudo*,¹⁰³ and akin to it, the *chelonium* (see p. 50) used in the catapult.

Servius¹⁰⁴ is quite explicit as to the reason for the term *testudo* when applied to the shields, attributing it to the general curving surface, not likening the individual shields to the segments of a carapace: *Testudo est scutorum connexio, curvata in testudinis modum.*

Apollodorus speaks with equal assurance in regard to the

¹⁰¹ Amm. xxvi, 8, 9.

¹⁰² Liv. xxxiv, 9. This passage is perhaps one of the sources of the previous citation.

¹⁰³ Cf. *testudinatum*.

¹⁰⁴ Serv. *Aen.* ix, 503. Quoted in Isid. *Orig.* xviii, 12, 6.

χελῶναι ἐλαφραί 'light tortoises,' which, he says, were constructed with the express purpose (ἵνα) of having their shape like that of the tortoise: γίγνονται δὲ ἀνισοῦψεῖς οἱ κάμακες παρ' ἑναῖ ἵνα τὸ ὑπ' αὐτῶν σχῆμα ᾗ χελώνη.¹⁰⁵

Varro likewise assigns the figurative use to a likeness in external appearance, as the connection indicates (see quotation p. 39).

We may conclude, then, that originally a device was needed to ward off weapons. The most effective contrivance happened to be convex, the shape of the tortoise. From this resemblance came the transferred use of the term *testudo*.¹⁰⁶

According to Isidore, the term *testudo* is likewise applied to an individual shield: Dicitur autem et testudo scutum. Nam in modum testudinis fit clypeus.¹⁰⁷

The name *testudo* is itself due to the resemblance between the *testae* of the vaulted roof to the segments of the curving shell: *Testudo* dictus, eo quod tegmine testae sit adopertus in camerae modum.¹⁰⁸

Fancy is given free rein in Martial's *testudo*¹⁰⁹ for the hedgehog's ball of spines and in Ovid's use of the term¹¹⁰ for an ornamental head-dress.

In post-classical Latin, *cancer*, 'crab,' and *cattus*, 'cat,' partly displaced the term *testudo*:

Expugnavit Rex hanc civitatem per duo vasa (instrumenta) concava, quae faciebant artifices sapientes. Unum vas Cattus vocabatur, aliud Cancer. Erant haec vasa longa, quadrata, ex omni parte laterum clausa: versus terram nullum munimen habebant, sed versus caelum de tabulis fortibus ac spissis tectum, machinarum lapides minime metuebat, etc.

¹⁰⁵ Math. Vett. p. 15.

¹⁰⁶ In vol. I, p. 244, of his revision of J. G. Wilkinson's *The Ancient Egyptians*, S. Birch has expressed the opinion that the *trypanon* or pike of the *testudo arietaria* of the Greeks and Romans, and the covering or *vinea* which protected the men while they worked the battering-ram, were most probably borrowed originally by the Greeks from Egypt.

¹⁰⁷ Isid. *Orig.* xviii, 12, 6.

¹⁰⁸ Isid. *Orig.* xii, 6, 56.

¹⁰⁹ Mart. xiii, 86, 1.

¹¹⁰ Ov. *Ars* iii, 147.

Infra :

Fuit Cancer instrumentum magnum forte, pariter et ponderosum. In eo erat trabs magna, pariter longa, in una parte grossa, in altera parva. In grossiori parte, sive in capite, fuit ferro forti circumdata, et in fronte ipsius Cancris fortissime colligata. Trabs haec super quaedam instrumenta jacuit, quod faciliter moveretur. Hic Cancer cum ad murum pervenisset, et octo in circulos, qui in trabe erant, funes immisissent, ex paucis ictibus pro magna parte cadere coegerunt.

Mox :

Ex parte terrae fuerunt obsessi per Cattum atque Cancrum; quia solus Cancer, quingentos homines occupabat.¹¹¹

Another instance of the *testudo* type of machine is found in *sus*, 'the sow': Unum fuit machinamentum, quod nostri Suem, veteres Vineam vocant, quod...protegit in se subsidentes, qui quasi more suis, ad murorum suffodienda penetrant fundamenta.

The *locusta* was a somewhat similar device: Locusta ambulatoria: intus homines ducentes eam, possunt se haerere muro aut prope murum castelli et defendere se a saxis hostium ac missilibus.¹¹³

The English has a rather striking figure prompted by the shape of the tortoise. *To turn turtle*, is common in nautical slang and its application has been extended to other fields. The figure is due, of course, to the shape of the hull of the capsized vessel.

Turtle is also used of the detachable segment of a rotary printing-machine.

TESTUDO ARIETARIA.

Vitruvius, after describing the invention of the simple *aries* whose weight was supported by men, tells in detail how it was made more efficient. It was supported on a cross-beam; then it was rendered movable by a platform

¹¹¹ Quoted by Du Cange, s. v. *Cancer*.

¹¹² Quoted by Du Cange, s. v. *Sus*.

¹¹³ Quoted by Du Cange, s. v. *Locusta*.

equipped with wheels; finally protection was afforded the soldiers working it by the addition of a covering of hides. With such a preface, he states that the complex machine, *testudo arietaria*, was so named by its inventor because of its sluggish movements: quod tardos conatus habuerat, testudinem arietariam appellare coepit.¹¹⁴

The grammatical relation shows that the combination of the words, *testudo arietaria*, is due to the development of the simple *testudo*, not the simple *aries*. When the functions of an instrument are enhanced, logic demands that the change be shown by an adjective. A lifting machine, when it has a fixed base, is called a *crane*. When the whole machine moves it is called a *traveling-crane*. When the *corvus*, primarily for piercing or holding, has its scope of operations increased so that it is adapted to tearing down walls, the new function is shown by an epithet, *demolitor*.

Vitruvius clearly thought that the *testudo arietaria* was developed from the simple *aries*. If this were so, and if the slow movements figured in the transfer, then we should expect an adjective *testudineus*, 'of tortoise-like sluggishness,' to show the new function of the *aries*, i. e. the machine would be *aries testudineus*, 'the ram of tortoise-like sluggishness.' If the instrument *aries* is the basis of the complex machine, then the term *aries* is logically the basis of the expression denoting the contrivance.

As it is, the grammatical order of the two words, *testudo arietaria*, *χελώνη κριοφόρος*, proves that the function of the *testudo* is increased. The Greek adjective *κριοφόρος*, where *κριο-* is the equivalent of an objective genitive, is sufficient evidence that *testudo arietaria* means, not 'the ram's tortoise,' but 'the ram-carrying tortoise,' i. e. the *tortoise* modified to carry a *ram*.

Vitruvius is apparently indebted to Athenaeus,¹¹⁵ who accounts for the transfer *διὰ τὴν βραδυτήτα* (*tarditatis causa*).

When the *testudo* was placed on wheels (*subrotata*) and

¹¹⁴ Vit. x, 13.

¹¹⁵ Math. Vett. p. 3.

equipped with a more ponderous framework to support the increased strain of an *aries* in action, its progress was necessarily impeded by the additional weight, especially where there were irregularities in the ground. Hence its movements resembled the sluggishness of the creature that Pacuvius calls *tardigrada*.¹¹⁶ Clearly the *testudo* sheltering the *ram* is an adaptation of a previous *testudo*, and the resemblance in the slow progress is an incidental and necessary concomitant. In other words its slowness is a result of the modified conditions, not a cause of the name.

MUSCULUS, A LITTLE MOUSE; *transf.*, A SMALL SHED-LIKE PROTECTION USED IN SIEGE OPERATIONS.

A very romantic flavor has been imparted by Vegetius to his description of the *Musculi*, the small shed-like protections for besiegers. They form the advance guard in storming cities, he informs us, and prepare the way for the larger siege machines. They receive their name from the sea *musculus*, which, though comparatively small, still furnishes aid and guidance to the whale: *Musculos dicunt minores machinas, quibus protecti bellatores sudatum auferunt civitatis; fossatum etiam adportatis lapidibus lignis ac terra non solum complent, sed etiam solidant, ut turres ambulatoriae sine impedimento iungantur ad murum. Vocantur autem a marinis beluis musculi; nam quem ad modum illi, cum minores sint, tamen balaenis auxilium adminiculumque iugiter exhibent, ita istae machinae breviores [vel] deputatae turribus magnis adventui illarum parant viam itineraque praemununt.*

The story that the sea-mouse was a sort of *cicerone* to the whale was too good for Pliny to omit. He cites the *musculus* as being a fish well known for its friendship for the whale. When the latter's vision is obstructed by his fat heavy eyebrows, the *musculus* swims ahead of his greatness, the whale, showing the treacherous shoals and performing the function of eyes: *amicitiae exempla sunt... balaena et musculus, quando praegravi superciliorum pondere*

¹¹⁶ Pac. ap. Cic. *Div.* ii, 64, 133.

¹¹⁷ Veg. iv, 16.

obrutis eius oculis, infestantia magnitudinem vada praenatans demonstrat, oculorumque vice fungitur.¹¹⁸

Although it is not essential for a belief to be well-founded in order to gain sufficient currency to effect a transfer, the metaphor of Vegetius appears too involved to appeal to the popular consciousness. It is hardly probable that the soldiers strained their imagination to such an extent when easy and obvious comparisons presented themselves at every turn.

In order to gain currency, a transfer must appeal to the rank and file of the soldiery. This means that the story would have to be generally known to the troops, and, in addition, that the preliminary manoeuvring of the *musculi* must be a regular part of siege tactics, a thing which is not emphasized by military writers.

Isidore's fanciful derivation from *muruscus* (*musculus* cuniculo similis fit, quo *murus* perfoditur, ex quo appellatur, quasi *muruscus*),¹¹⁹ is another indication of the density of the mist that beclouded the real etymology.

Oman states¹²⁰ that the bore and its shelter are sometimes referred to in the chronicles under the one term "*musculus*, 'the mouse,' because its object was to gnaw a round hole in the lower courses of the rampart."

In classic times, the *musculus* was always clearly differentiated from the *terebra*, and its employment to protect the operation of the latter machine was but one of several applications.

If the figure were that of gnawing, we should expect the term *musculus* to be applied first to the bore or pick, and then by synecdoche to the mantlets, whereas the converse appears to have been the case, e. g. *cupiunt murum succidere musclis*.¹²¹

¹¹⁸ Plin. *Nat.* ix, 62, 88, (186). Cf. also id. xi, 37, 62, (165), *Musculus marinus*, qui balaenam antecedit. The English has a close analogy in the pilot-fish, "so named because it is often seen in company with a shark, swimming near a ship, on account of which sailors imagine that it acts as a pilot to the shark." Webster.

¹¹⁹ Isid. *Orig.* xviii, 11, 4.

¹²⁰ Oman, *A History of the Art of War*, p. 133.

¹²¹ Abbo, *De Bellis Parisiacae Urbis*, i, 99 in *Scriptores Rerum Germanicarum*.

Again, had the idea of gnawing even remotely occurred to the Romans, it is difficult to understand how Isidore, who ransacked Latin literature for derivations, should be driven to his hypothesis, especially when he uses *perfodio*, a term suggestive of gnawing.

The appositeness of the figure of gnawing seems to be merely incidental, and that with a special use of the *musculus* at a time when the bore was one of the two great weapons of siegecraft.

When one considers the epithets and verbs descriptive of the advance of machines of the mantlet character, it seems hardly probable that all should escape a sobriquet recalling the method of locomotion. Several machines of the *musculus* type are said to creep.

Lucan pictures vividly the advance of the *vinea*; mediis subrept vinea muris.¹²²

In the case of the large towers, this verb is very appropriate because of the motion of the wheels:

Hae (turres) nullo fixerunt robore terram,
Sed per iter longum causa repsere latenti.¹²³

In the *cat*, the creeping is again prominent.

Huc faciunt reptare Catum, tectique sub illo
Suffodiunt murum.¹²⁴

Significant is the epithet 'creeping' in *locusta ambulatoria* (see p. 24), likewise a machine to protect storming parties.

The alternative of creeping affords an easy transition for the figure, and while not so striking as the reason adduced by Vegetius, is still highly picturesque.¹²⁵ As the adjective

¹²² Lucan, ii, 506.

¹²³ Lucan, iii, 457-458.

¹²⁴ Quoted by Du Cange, s. v. *Catus*.

¹²⁵ In *A Dream of Fair Women*, Tennyson adds a touch of life to his picture by the use of the epithet *creeping*:

Heroes tall
Dislodging pinnacle and parapet
Upon the tortoise creeping to the wall.

In English, the figure of creeping or crawling appears in *caterpillar-traction-engine*. *Worm-fence* and *snake-fence* suggest the sinuous appearance of their animal prototypes when in motion.

'walking' is very apropos for the erect advance of the tall perpendicular towers, *turres ambulatoriae*, so the term *musculi* is quite suited for describing the low horizontal machines, which move slowly and with their bodies almost upon the ground.

The fact that *musculus*, a muscle, is a figure drawn from the creeping motion, that of the biceps, supports this view.

TEREBRA A WOOD-WORM (?): A BORE FOR PENETRATING WALLS DURING SIEGES.

An instance of popular etymology, suggesting that of *sparrow-grass* in English, is seen in Isidore's derivation for *terebra*: *Terebra vocata a verme ligni, qui vocatur terebra, quem Graeci τερεδόνα (sic) vocant. Hinc dicta terebra, quod ut vermis terendo forat, quasi terefora, vel quasi transforans.*

CORVUS, GK. κόραξ CROW: *transf.*, 1. A GRAPNEL; 2. A BATTERING INSTRUMENT.

Corvus is a picturesque term for a pointed instrument. Even the clutch of the hand-bow, χειρουργικὸν τόξον, probably gets its name, according to the scholiast, from its likeness to the beak of the bird: addimus fieri posse corvum ideo appellatum quod corvi caput cum (*sic*) suo rostro imitetur.¹²⁷

If a machine resembled the beak of a bird, it was very natural for *corvus* to be selected as its name, since the strength and power of that bird are subjects of frequent comment. Aristotle applies to the crow the terms, ἰσχυρὸν καὶ σκληρόν,¹²⁸ 'strong and destructive.'

Egyptian crows, κόρακες Αἰγύπτιοι, says Aelian, on failing to get what they want, perch in flocks upon ships and sever the cables and rigging by pecking: ἀτυχήσαντες δὲ ὧν ἡτοῦν, συμπέτονται, καὶ ἑαυτοῦς καθίσαντες ἐπὶ τὸ κέρας τῆς νεὸς τῶν σχοίων ἐσθίουσιν τε καὶ διατέμνουσιν τὰ ἄμματα.¹²⁹

The crows of Libya are famed for their lifting ability,

¹²⁶ Isid. *Orig.* xix, 19, 14.

¹²⁷ Math. Vett. p. 333.

¹²⁸ Arist. *De Part. Anim.* 662 b.

¹²⁹ Ael. *N. A.* ii, 48.

being adept at picking up stones with both beak and claw: *ψήφους κομίζουσι καὶ τῷ στόματι καὶ τοῖς ὄνυξι, καὶ ἐμβάλλουσιν ἐς τὸν κέραμον.*¹³⁰

The crow also employs its mandibles with great skill, being able to gouge out the eyes, even of the larger animals, such as the ass and the bull: *ὁμόσε τοῖς ζώοις χωρεῖ, οὐ μέντοι τοῖς βραχυτάτοις, ἀλλ' ὄνῳ τε καὶ ταύρῳ. κάθηται τε γὰρ κατὰ τῶν τεινόντων καὶ κόπτει αὐτούς, πολλῶν δὲ καὶ ὀφθαλμοὺς ἐξέκοψεν ὁ κόραξ.*¹³¹

Livy's story¹³² of Corvinus and the crow likewise attests the strength of the crow's beak.

These stories, irrespective of their truth, show the popular belief in the efficacy of the crow's beak, and in addition to this, the annual depredations of the crow at seed-time kept the destructiveness of its mandibles constantly in mind.

To Duilius at the battle of Mylae in 260 B. C. is ascribed the invention of the *corvus* as an instrument of warfare.¹³³ Polybius¹³⁴ says that the idea was suggested by a seaman and that thereafter (*μετὰ ταῦτα*) it was called *κόραξ*. In apparent conflict with this account is Curtius's statement that a *κόραξ* was employed by the Tyrians in the defence of their island city against the hosts of Alexander the Great in 332 B. C.

The grapnels referred to before this time are the *χείρες σιδηραῖ* of Thucydides.¹³⁵ After the fall of Tyre, *χείρες σιδηραῖ* (*manus ferreae*) and *κόρακες* (*corvi*) are found in constant association, as in Diodorus¹³⁷ and in Curtius.¹³⁸

The difference lies in the fact that the grapnels had several prongs for grasping, whereas the *κόρακες*, like tongs,

¹³⁰ Ael. N. A. ii, 48.

¹³¹ Id. ii, 51.

¹³² Liv. vii, 26.

¹³³ Maufraſ, in his edition of Vitruvius, bk. x, n. 102, mentions the discrepancies with regard to the invention of the *corvus*, but ventures no explanation. Polybe et Frontin disent que le consul C. Duillius, qui commandait l'armée navale des Romains, fut l'inventeur de cette machine, quoique Q. Curce en attribue l'invention aux Tyriens, lorsque leur ville fut assiégée.

¹³⁴ Polyb. i, 22, 3.

¹³⁵ Curt. iv, 2, 12.

¹³⁶ Thuc. iv, 25, 4; vii, 62, 3.

¹³⁷ Diod. xvii, 44, 4.

¹³⁸ Curt. iv, 3, 26.

had only two, and they were manipulated like the mandibles of a crow; hence the figure.

The Tyrian *corvus* was fashioned as a defensive engine, *corvique et alia tuendis urbibus excogitata praeeparabantur*,¹³⁹ for grasping and seizing.

The *corvus* of Duilius, unlike that of the Tyrians, was distinctly offensive. Its end was tipped with iron sharpened to a point, and shaped like a baker's pestle, as Polybius states: ἐπὶ δὲ τοῦ πέρατος αὐτοῦ (στύλου) προσήρμοστο σιδηροῦν οἶον ὑπερον ἀπαξυσμένον.¹⁴⁰

The comparison with the pestle shows that the instrument is likened to a crow with closed mandibles, to facilitate piercing. It was intended, as Polybius goes on to say, to hold the ships together by forcing its way through the deck, not by grappling: ὅτε δὲ ταῖς σανίσιν τῶν καταστρωμάτων ἐμπαγέντες οἱ κόρακες ὁμοῦ συνδήσαιεν τὰς ναῦς.¹⁴¹

As the *corvus* of Duilius resembled that of the Tyrians in name only and not in purpose or construction, Polybius is correct in his statement with regard to Duilius's invention of a crow.

Vitruvius speaks of a *corvus demolitor*,¹⁴² which evidently is identical with an engine that Vegetius describes, although the latter does not use the term *corvus*. The two descriptions are quite similar. Vegetius comments as follows: *trabem, quae adunco praefigitur ferro et falx vocatur ab eo, quod incurva est, ut de muro extrahat lapides*.¹⁴³

Polybius's words are somewhat analogous: ἐπὶ δὲ τοῦ πέρατος αὐτοῦ (στύλου) προσήρμοστο σιδηροῦν οἶον ὑπερον.¹⁴⁴

Both devices had a long beam equipped with iron at the end. The difference is that Vegetius's machine was hooked, for the purpose of tearing stones from walls, evidently from the top, whence the epithet *demolitor*.

A fuller quotation of Vegetius shows that he is thinking of an instrument quite analogous to the *aries* in construction, and not very dissimilar to it in its application: *Haec (testudo) intrinsecus accipit trabem, quae aut adunco prae-*

¹³⁹ Curt. iv, 2, 12.

¹⁴⁰ Polyb. i, 22, 7.

¹⁴¹ Id. i, 22, 9.

¹⁴² Vitr. x, 13, 4.

¹⁴³ Veg. iv, 14.

¹⁴⁴ Polyb. i, 22, 7.

figitur ferro et falx vocatur ab eo, quod incurva est, ut de muro extrahat lapides, aut certe caput istius vestitur ferro et appellatur aries.¹⁴⁵

The *corvus* then had three distinct military uses, as is shown by the operations at Tyre and off Mylae and by the *corvus demolitor*, the transfer being due in each instance to the resemblance to the closed or open mandibles of the bird.

The comparison with the beak of a bird was prompted by the shape of the end of the implement; the selection of the term *corvus*, however, was due to the fact that the crow is the most common bird with strong mandibles.

In English, the figurative use of the word *crow* is common in the mechanical world in *crow-bar*. Colloquially we have such expressions as *to crow over*, *as the crow flies*, and the like.

In *alligator-wrench* there is present the figure of fixed gaping jaws and in *monkey-wrench*, that of a movable jaw.

CORAX, GK. κόραξ A CROW: *transf.*, A KIND OF BATTERING DEVICE.

Vitruvius speaks of the *corax* very disparagingly, stating that it is utterly ineffective: De corace nihil (Diades) putavit scribendum, quod animadverteret eam machinam nullam habere virtutem.¹⁴⁶

Vitruvius is quoting an earlier military writer, Diades, probably through Athenaeus, for the latter refers to the κόραξ in the same vein: τὸν δὲ κόρακα, οὗ φημι εἶναι ἀξιὸν κατασκευῆς.¹⁴⁷

The *corax* suggests the *corvus demolitor*. It seems possible that the direct transliteration from the Greek in *corax* and the epithet in *corvus demolitor* serve the same purpose, that of differentiating the *battering-crow* from the types employed at Tyre and off Mylae.

¹⁴⁵ Veg. iv, 14.

¹⁴⁶ Vittr. x, 13, 8.

¹⁴⁷ Math. Vett. p. 5.

GRUS, GK. γέρανος, CRANE; transf., 1. A BATTERING INSTRUMENT; 2. A LIFTING DEVICE.

Vitruvius in speaking of the *corvus demolitor*, a sort of battering instrument (see p. 31), says that it is sometimes dubbed *grus*: *corvum demolitorem quem nonnulli gruem appellant*.¹⁴⁸

As several of these animal names reflect their Greek origin, this use of *grus* may have been influenced by the wooden pounding device, called γέρανος, which the Greek miller employed in crushing his grain. Hesychius comments on γέρανος in this sense: ὄργανον ξύλινον, ἐν ᾧ κόπτουσιν οἱ ἀλφιτοποιοὶ τὰ ἀλφίτα.

It will be recalled that Polybius compares the *corvus* of Duilius to a baker's pestle.¹⁴⁹

Although Vitruvius's casual remark, in which the term *grus* is applied to a battering instrument, is the only direct reference in Classic Latin to a military *grus*, we can postulate the existence of another *grus*, a lifting device somewhat similar to the Tyrian *corvus*. As in the previous instance, *grus* was the vulgar word, while *corvus* was in good standing. Though the term *corvus* at first reigned supreme, *grus* at an early period challenged its position, and after centuries of conflict finally supplanted its predecessor.

The lifting *corvus*, which is first mentioned in connection with the siege of Tyre, was manipulated by a series of pulleys and tackle. In describing the siege of Syracuse, Plutarch mentions the γέρανος, although in a rather reserved manner: τὰς δὲ (ναῦς) χερσὶ σιδηραῖς ἢ στόμασιν εἰκασμένοις γεράνων, ἀνασπῶσαι (κεραταί) πρῶραθεν ὀρθὰς ἐπὶ πρύμναν ἐβάπτιζον.¹⁵⁰

Athenaeus in describing the same machines calls them *iron-crows*, showing that neither term was used to the exclusion of the other: κόρακες τε σιδηροὶ κύκλω τῆς νεὼς οἱ δι' ὀργάνων ἀφίεμενοι τὰ τῶν ἐναντίων ἐκράτουν σκάφη.¹⁵¹

¹⁴⁸ Vitruv. x, 13, 4.

¹⁴⁹ Polyb. i, 22, 7.

¹⁵⁰ Plut. Marcellus, xv.

¹⁵¹ Ath. p. 208 d.

Polybius refers to these contrivances of Archimedes without committing himself to the use of either term.¹⁵²

Tacitus, in his *Histories*, alludes without doubt to the *grus* adapted to military purposes, but, with his usual aversion for undignified animal names, he eschews the use of the term. Under the general term *machinamentum*, he pictures in vivid colors the manner of working the *grus*, telling how it was lowered and how it carried off members of the storming party, placing them within the walls: Praecipuum pavorem intulit suspensum et nutans machinamentum, quo repente demisso praeter suorum ora singuli pluresve hostium sublime rapti verso pondere intra castra effundebantur.¹⁵³

Such a use of the *grus* in siege operations was long before foreshadowed by the stage γέρανος, which removed actors or corpses from the stage: ἡ δὲ γέρανος μηχανήμα ἐστὶν ἐκ μετεώρου καταφερόμενον ἐφ' ἀρπαγῇ σώματος ᾧ κέχρηται ἥως ἀρπάξουσα τὸ σῶμα τὸ Μέμνονος.¹⁵⁴

That the term *grus* was applied to such a contrivance is indicated by the various forms of the word *grus* which appear in the Romance languages to denote the machine.

Fr. *Grue*. Grande machine avec quoi on élève de grosses pierres pour les bâtiments.

Sp. *Grua*. Pescante, instrumento compuesto de poleas, cuerdas y ganchos, para subir y levantar cosas de peso.

It. *Gru*. Macchina per la cui azione si sollevano i pesi.

Lengua Castellana, *Grua*. Se usa principalmente en los muelles, para la carga y descarga de buques.

Port. *Grou*. Guindaste, polé.

Other nations which derived their civilization from the Romans simply translate the old *grus*: cf. English *crane*; German *Krahn*.

We may conclude from this evidence that just as the colloquial *manduco* and *caballus* existed side by side with the literary *edo* and *equus*, and finally displaced them, so the vulgar *grus* struggled with *corvus* for recognition and

¹⁵² Polyb. viii, 6, (8), 1 sq.

¹⁵³ Tac. *Hist.* iv, 30.

¹⁵⁴ Poll. iv, 130.

ultimately achieved a signal victory over its more aristocratic synonym before the lines between the Romance languages were clearly drawn.

The rivalry between *grus* and *corvus* may perhaps be roughly paralled in English by *alligator-wrench* and *crocodile-wrench*. The latter expression, perhaps a provincialism, is sometimes used colloquially, though recognized by no standard dictionary. *Alligator-shears* and *crocodile-shears* are however regarded as identical by *The Century Dictionary and Cyclopaedia*.

The transfer of the term γέρανος is, of course, due to a fancied resemblance between the long neck of the bird and the projecting arm of the machine. The Greek writers make frequent comment on the neck of the crane, sometimes in complimentary terms, sometimes disparagingly.

Homer expresses his admiration in a graceful hexameter: *χηνῶν ἢ γεράνων ἢ κύκνων δουλιχοδείρων*.¹⁵⁵

Aristotle in more prosaic fashion speaks of the long necks, τοὺς τραχήλους μακροὺς¹⁵⁶ of the cranes, and in other passages shows that it was proverbial for an epicure to wish for a gullet like a crane's: *ἡῤῥατό τις ὀψοφάγος ὦν τὸν φάρυγγα αὐτῷ μακρότερον γεράνου γενέσθαι*.¹⁵⁷

SUCULA, A LITTLE PIG; transf., A WINDLASS, USED IN THE SCORPION AND CATAPULT,¹⁵⁸ AS WELL AS IN OTHER DEVICES.

PORCULUS, A LITTLE PIG; transf., A CLUTCHING DEVICE USED WITH THE SUCULA.

Festus attributes the transfer in the meaning of *sucula* to the figure of a breeding sow, surrounded by her litter: *Sucula est machinae genus teretis materiae, et foratae, ac crassae, quam, ut uber scrofae, porculi circumstant sic, ver-santesque ductario fune volvunt*.¹⁵⁹

¹⁵⁵ Il. ii, 460.

¹⁵⁶ Arist. *De Acoust.* 800 b.

¹⁵⁷ Arist. *Nic. Eth.* 1118 a. Cf. Athen. iv, 131 e: γέρανος τουτουι του χασκοντος διατειναμένη δια του πρωκτου και των πλευρων διακόψειεν το μέτωπον.

¹⁵⁸ Vitruv. x, 12, 1.

¹⁵⁹ Fest. p. 301 Müll.

Walde in the first edition of his Latin etymology¹⁶⁰ distinguishes between *sucula*, the diminutive of *sus*, and *sucula*, the windlass. If that distinction be warranted, the figurative use of *sucula* in Festus is a case of popular etymology, much like that of *sparrow-grass* or *cow-cumber* in English. The mistake would recall the popular misconception of *suculae*, 'Hyades,' which must have caused Pliny much amusement. His comment is as follows: *Nostri a similitudine cognominis Graeci, propter sues inpositum arbitantes, inperitia appellavere suculas.*¹⁶¹

In his second edition, however, Walde regards *sucula*, a little pig, and *sucula*, a windlass, as identical in origin. When the term *sucula*, a windlass, was derived, whether popularly or deliberately, from *sucula*, a little pig, it was an easy transition to liken the clutch in the device to a suckling pig. It is quite evident that Cato had such a figure in mind when he gave directions for the construction of a wine-press: *Porculum in media sucula facito.*¹⁶²

The metaphor in *porculus* is then a logical extension of the figure in *sucula*.

In English, the term *dog* is used to denote the device for clutching and holding a cable in a windlass. We may compare also the Greek use of *ὄνος, ὀνίσκος*, a windlass, winch or handle of a windlass, the figure being developed from the idea of the ass as a beast of burden.

CAPUT PORCI (vel PORCINUM): A HOG'S HEAD; transf., A WEDGE-SHAPED ORDER OF BATTLE.

Hog's head was a popular expression in the *sermo castrensis* to denote the V or wedge-shaped formation of battle.

Ammianus writes as follows with regard to the military *porcus*: *desinente in angustum fronte, quem habitum caput porci simplicitas militaris appellat.*¹⁶³

Vegetius comments with greater detail: *Cuneus dicitur multitudo peditum, quae iuncta cum acie primo angustior,*

¹⁶⁰ Walde, *Lat. etym. Wörterbuch*, s. v.

¹⁶¹ Plin. *Nat.* xviii, 26, 66, (247).

¹⁶² Cato, *Agr.* xix, 2.

¹⁶³ Amm. xvii, 13, 9.

deinde latior procedit et adversariorum ordines rumpit, quia a pluribus in unum locum tela mittuntur. Quam rem milites nominant caput porcinum.¹⁶⁴

The transfer, as is shown by the synonym *cuneus*, is due to the shape, although we may well suppose that the epithet owed its favor to the pictures it recalled in the minds of the soldiers, who, as country lads, had seen the destructive snout plough its way through the earth in search of roots.

ERICIUS, A HEDGE-HOG: *transf.*, A DEVICE EQUIPPED WITH SPINOSE SHAFTS TO REPEL OR RETARD ASSAILANTS.

The *ericius* was a defensive contrivance equipped with long echinated shafts. While it is not described in detail by any Latin author, its structure may easily be imagined with the aid of a passage in which Sallust makes it the basis of a comparison. He tells how javelins radiated from an axle in the manner of a military *ericius*: Saxaque ingentia et orbis axe iuncti per pronum incitabantur, axibusque eminebant in modum ericii militaris veruta binum pedum.¹⁶⁵

It is of course obvious that the likeness is between the spines of the animal and the spinose shafts of the device. This transfer must have appealed to the soldiers, since the animal, as Pliny shows, is ready, when curled up like a ball, to ward off its foes: ubi (erinacei) sensere venantem, contracto et ore pedibusque ac parte omni inferiore, quarum et innocuam habent lanuginem, convolvuntur in formam pilae, ne quid comprehendere possit praeter aculeos.¹⁶⁶

Some time later, Cassiodorus draws a lesson from the hedge-hog, which, thanks to an all-wise nature, is always under arms, being protected by a countless number of the sharpest spines: Herinacius... est, quem vocamus hericium, animal omnino timidum, natura providente semper armatum: cuius cutem in vicem setarum sudes acutissimae densissimaeque communiunt.¹⁶⁷

Analogous to the military *hedge-hogs*, but with a meta-

¹⁶⁴ Veg. iii, 19.

¹⁶⁵ Sall. apud Non. 555, M.

¹⁶⁶ Plin. Nat. viii, 37, 56, (133).

¹⁶⁷ In Psalm. 103, 18.

phor less suggestive of their animal prototypes, are the *Frisian horses*, *cheveux-de-frise*, of the seventeenth century, which were pieces of timber set with long iron spikes and employed in defensive operations, especially against cavalry charges.

CERVI ET CERVOLI, DEER: *transf.*, ANTLER-LIKE
BRANCHES SET UP IN THE GROUND.

The *cervi* were sharpened branches of trees set up to obstruct or impede the advance of a foe. Caesar used them effectively at the siege of Alesia: Huic (vallo) loricam pinasque adiecit, grandibus cervis eminentibus ad commissuras pluteorum atque aggeris, qui ascensum hostium tardarent.¹⁶⁸

The *cervi* were also used to block the progress of an enemy in the open:

Quaque patet campus planis ingressibus hostis,
Cervorum ambustis imitantur cornua ramis, . . .¹⁶⁹

The *cervoli*, *cheveux-de-frise* on a small scale, are recommended by Hyginus for use in fortifications:

Cervoli trunci ramosi. Ad hos decurritur, si soli natura nimia teneritate cespes frangitur, neque lapide mobili nisi confragosum vallum extrui potest, nec fossa fieri, ut non ripae decidant.¹⁷⁰

The metaphor in this instance is unusually easy, since the terms *ramus* and *ramosus* were regularly used for the antlers of the deer. Pliny does not hesitate to call them *rami*, 'branches'; (Natura) lusit animalium armis, sparsit haec in ramos, ut cervorum.¹⁷¹

Phaedrus uses the figure very felicitously as he pictures a stag admiring his branching antlers reflected in a spring:

Ad fontem cervus, cum bibisset, restitit,
Et in liquore vidit effigiem suam.
Ibi dum ramosa mirans laudat cornua . . .¹⁷²

¹⁶⁸ Caes. *Gall.* vii, 72, 4.

¹⁶⁹ Sil. x, 412-3.

¹⁷⁰ Hyg. *Mun. Castr.* 51. Cf. also Frontin. *Strat.* i, 5, 2.

¹⁷¹ Plin. *Nat.* xi, 37, 45, (123). Cf. id. viii, 22, 50, (116).

¹⁷² Phaedr. i, 12, 3-5.

Vergil uses the adjective *arboreus* as well as *ramosus* in describing the branch-like appearance of the horns.¹⁷³

Since *ramus* and *ramosus* are applied so freely to the antlers of the stag, it is very natural for *cervi* to be employed for the antler-like branches.

Varro's explanation that the term is due to the resemblance to the horns is, of course, obvious: *Cervi ab similitudine cornuum cervi: item reliqua fere ab similitudine ut vineae, testudo, aries.*¹⁷⁴

**ONAGER, GK. ὄναγρος, A WILD ASS; transf.,
AN ENGINE FOR THROWING STONES.**

Ammianus has enlivened his account of the transfer of *onager* by a piece of striking imagery. A new style of speaking, says he, applied the term *onager* because the wild ass, on being pressed by hunters, kicks up stones with such force that they penetrate the breasts of the pursuers, or break bones, crushing even the skull itself: *onagri vocabulum indidit aetas novella ea re, quod asini feri cum venatibus agitantur, ita minus lapides post terga calcitrando emittunt, ut perforent pectora sequentium aut perfractis ossibus capita ipsa displodant.*¹⁷⁵

Judging from the tales of the effectiveness of this machine one may conclude that it was a worthy representative of its animal prototype.

Ammianus informs us that it utterly disintegrated whatever it struck: *Nam muro saxeo huius modi moles (onager) inposita disiectat quidquid invenerit subter concussione violenta, non pondere.*¹⁷⁶

Vegetius too brings before us in animated terms an idea of its destructiveness. Stones thrown by it crush the bones of man and beast, and even disable the weapons of the foe. No fortification can withstand its blows, since it hurls missiles with lightning-like rapidity, leaving ruin in their path: *Onager dirigit lapides... Saxis gravioribus per onagrum*

¹⁷³ Verg. *Aen.* 1, 190; *Ecl.* vii, 30.

¹⁷⁴ Varro *Ling.* v, 117.

¹⁷⁵ Amm. xxiii, 4, 7.

¹⁷⁶ Amm. xxiii, 4, 5.

destinatis, non solum equi eliduntur et homines, sed etiam hostium machinamenta franguntur.¹⁷⁷

Ballistae et onagri, si a peritis diligentissime temperentur, universa praecedunt, a quibus nec virtus ulla nec munimina possunt defendere bellatores. Nam more fulminis quicquid percusserit aut dissolvere aut inrumpere consuerunt.¹⁷⁸

It is clear that the basis of the transfer of meaning lies in the similarity between the motion of the arm of the *onager* in discharging missiles and the animal's use of its hind legs. The relation of cause and effect was again obscured by the Romans, who emphasized the likeness in results.

The Greek *ὄναγρος* as a ballista is late and evidently reflects Latin usage. Procopius speaks of it as though it were rather unfamiliar: σφενδόνη δὲ αὐταί (αἱ μηχαναί) εἰσιν ἐμφορεῖς καὶ ὄναγροι ἐπικαλοῦνται.¹⁷⁹

The *ὄναγροι* of Suidas were defensive machines to seize assailants, the figure being due to the biting of the animal: ὄναγροι μηχανήματα, οἱ λεγόμενοι ἄρπαγες, οὔγε ἀρπάζειν τοὺς προσιόντας ἐπιβαλλόμενοι εἶχον.

Instead of the horse, the ancients regularly used as beasts of burden and for menial tasks animals of the same genus as the *onager*, and so had ample occasion to note their freedom with their heels. Pliny recommends the administering of frequent potions of wine to check the familiarity of the mule in this respect: Mulae calcitratus inhihetur vini crebriore potu.¹⁸⁰ In the same chapter, he pays his respects to the unusually hard hoofs of the animal: duritia eximia pedum.

Its dangerous heels enabled the wild-ass to make an alliance with the lion:

Θήρης ὄναγρος καὶ λέων ἐκοινώνουν
ἀλκῇ μὲν ὁ λέων, ὁ δ' ὄνος ἦν ποσὶν κρείσσων.¹⁸¹

¹⁷⁷ Veg. iv, 22.

¹⁷⁸ Id. iv, 29.

¹⁷⁹ Procop. B. G. i, 21, 19.

¹⁸⁰ Pliny Nat. viii, 44, 69, (174). Cf. also id. xxx, 16, 53, (149): mulas non calcitrare, cum vinum biberint.

¹⁸¹ Babr. 67, 1-2.

It is quite possible that it is the hoofs of the ass and mule, as well as those of the horse, whose imprint we see in the Latin *recalcitro*, and the English descendant, *recalcitrant*.

**EQUULEUS (ECULEUS), A LITTLE HORSE; *transf.*,
AN INSTRUMENT OF TORTURE.**

While the *equuleus* is not properly included under the *Machinae Bellicae*, it was sometimes used in camp life as Curtius shows: Tot conscii, nec in eculeum quidem inpositi, verum fatebuntur?¹⁸²

Prudentius refers to the *equuleus* as a *noxialis stipes*, evidently a piece of timber of stout body, which assisted perhaps by converging supports, somewhat similar to stocky legs, roughly resembled a horse.¹⁸³

Isidore, however, assigns another reason for the transfer, attributing it to the method of inflicting torture: Equuleus autem dictus quod extendat.¹⁸⁴

The transfer in meaning is made easy by the fact that the horse is an animal traditionally associated with torture.

Among the early Achaeans, says Murray, "if a woman attempted to bear a child to any man but her special master, she was apt to be burned alive, or torn asunder by horses."¹⁸⁵

In speaking of the mutilation of the corpse of Hector, the same author says: "A far worse story was really handed down by the tradition. There are fragments of the rude unexpurgated saga still extant, according to which Hector was still alive when his enemy tied him to the chariot rail and proceeded to drag him to death. Sophocles, always archaic in such matters, explicitly follows this legend (*Ajax*, 1031). So does Euripides (*Androm.* 399). Even so late a writer as Vergil seems to adopt it."¹⁸⁶

The Vergil passage runs as follows:

¹⁸² Curt. vi, 10, 10. Cf. also Amm. xiv, 5, 9.

¹⁸³ Cf. *Vaulting-horse*, *wood-horse*.

¹⁸⁴ Isid. *Orig.* v, 27, 21.

¹⁸⁵ Murray, *The Rise of the Greek Epic*, p. 75.

¹⁸⁶ Murray, *id.* p. 118.

Hector

Visus adesse mihi largosque effundere fletus,
 Raptatus bigis, ut quondam, aterque cruento
 Pulvere perque pedes traiectus lora tumentis.¹⁸⁷

According to one form of the story, Dionysus had the limbs of Lycurgus wrenched apart by horses: καὶ κεῖ κατὰ Διονύσου βούλῃσιν ὑπὸ ἵππων διαφθαρεῖς ἀπέθανε.¹⁸⁸ This version may have been familiar to the Romans through the *Lycurgus* of Naevius.

Livy, too, presents a gruesome picture, depicting the fate of the treacherous Alban dictator Mettius:

Exinde duabus admotis quadrigis in currus earum distentum inligat Mettium, deinde in diversum iter equi concitati lacerum in utroque curru corpus, qua inhaeserant vinculis membra, portantes. Avertere omnes ab tanta foeditate spectaculi oculos. Primum ultimumque illud supplicium apud Romanos exempli parum memoris legum humanarum fuit.¹⁸⁹

Casual remarks by Seneca, eculeo longior factus,¹⁹⁰ 'made longer by a horse'; by Ammianus, intendebantur eculei,¹⁹¹ 'the horses were stretched'; and by Hieronymus, quum eculeus corpus extenderet,¹⁹² 'when the horse stretched the body,' emphasize the same idea that Isidore presents.

Prudentius gives a vivid picture of the operation of the *eculeus*:

Vinctum, retortis brachiis,
 Sursum ac deorsum extendite,
 Compago donec ossuum
 Divulsa membratim crepet.¹⁹³

It seems safe to conclude that, although the stout body, assisted perhaps by its stalwart supports, suggested an animal, still the use of the term *equuleus* was due to the traditional association of the horse with torture.

¹⁸⁷ Verg. *Aen.* ii, 270 sqq.

¹⁸⁸ Apollod. iii, 5.

¹⁸⁹ Liv. i, 28, 10-11.

¹⁹⁰ Sen. *Epist.* 67, 4.

¹⁹¹ Amm. xiv, 5, 9.

¹⁹² Hier. *Epist.* i, 3.

¹⁹³ Prud. *Perist.* v, 109-112.

Analogous to this use of *equuleus* are the following:

It. Cavelleto: Spezie di tormento a cui si ponevano i rei per far loro confessare la colpa.¹⁹⁴

Fr. Chevalet: Sorte de cheval de bois à dos en arête sur lequel on mettait, avec des boulets aux pieds, les soldats qui avaient commis certains fautes.¹⁹⁵

Ger. Esel: Der hölzerne Esel, ein Strafmittel für Soldaten.¹⁹⁶

Eng. Steed: An English religious poet of the fourteenth century says of Christ, "on stokky stede he rode."¹⁹⁷

Eng. Horse: A wooden frame, sometimes called a timber mare, on which soldiers are sometimes compelled to ride as a punishment.¹⁹⁸

MURMILLO or **MIRMILLO**,¹⁹⁹ A KIND OF SEAFISH;
transf., A GALLIC HELMET.

The scholiast on Juvenal attributes the transfer to the fish represented on the helmet: Mirmillo²⁰⁰ armaturae Gallicae nomen, ex pisce inditum, cuius imago in galea fingitur.

Too little credence²⁰¹ is given to the words of the scholiast, since from Festus we may infer that the use of *murmillo* for the helmet was an intermediate stage between the adoption of the device and the use of the term for a gladiator. *Murmillones* replaced the term *Galli* to indicate the men who wore the *murmillonic* kind of armor: *murmillonicum* genus armaturae Gallicum est ipsique *murmillones* ante Galli appellabantur, in quorum galeis piscis effigies inerat.²⁰²

In spite of the silence of the lexicographers, there seems

¹⁹⁴ *Dizionario della Lingua Italiana*, Tommaseo e Bellini.

¹⁹⁵ *Dictionnaire Général de la Langue Française*, Hatzfeld et Darmesteter.

¹⁹⁶ *Deutsch-englisches Wörterbuch*, Lucas.

¹⁹⁷ *Words and their Ways in English Speech*, Greenough and Kittredge, p. 367.

¹⁹⁸ *The Century Dictionary*.

¹⁹⁹ ob zu gr. *μормύλος, μормύνος*, 'eine Art Meerfisch.' Walde *Lat. etym. Wörterbuch*, s. v.

²⁰⁰ Schol. ad Juv. viii, 200. Forcellini s. v. questions this reading by *μνηρία, σφάλμα.* Jahn however makes no comment upon it.

²⁰¹ Harper's Dict. and Walde give only one meaning.

²⁰² Paul. Fest. p. 284 Müll.

to be no doubt that the term *murmillio* was actually applied to the armor as well as to the gladiator.

An interesting parallel of an emblem or device giving rise to a sobriquet is afforded by "*culverin* from *L. coluber*, 'snake,' because the figure of a serpent was frequently engraved on ordnance of this kind."²⁰³

MUREX, A SHELL-FISH: *transf.*, CALTROP.

Under its Greek name, *tribulus*, Vegetius describes the military *murex* as a defensive device with four sharp shafts radiating from it in such a way that, no matter how it was thrown, one shaft always remained upright in a threatening position: *Tribulus est ex quattuor palis confixum propugnaculum, quod, quomodo abieceris, tribus radiis stat et erecto quarto infestum est.*²⁰⁴

The effectiveness of the contrivance is manifested in Polyænus's account of the operations of Nicias against the Syracusans. During the night the Athenians scattered caltrops over the level plain. When the enemy charged, they found their progress hindered since the points penetrated the hoofs of their horses: *Νικίας, στρατοπέδων Ἀθηναίων περὶ τὸ Ὀλυμπον, ἐς τὸ πρὸ τοῦ στρατοπέδου χωρίον, ὁμαλὲς ὄν, ἐκέλευσε νύκτωρ τριβόλους κατασπείραι. Ἐπεὶ δὲ τῆς ὑστεραίας Ἐκφαντος ὁ Συρακουσίων ἵππαρχος προήγαγε τοὺς ἵππους, ἦν αὐτῶν αἰσχυρὰ φυγή, τῶν τριβόλων ἐμνηγνυμένων ἐν τοῖς ποσὶ τῶν ἵππων. πολλοὶ δ' αὐτῶν οὐδὲ προβαίνειν οἶοί τε ἦσαν, ἀλλ' ὑπὸ τῶν πελταστῶν στερεὰ ὑποδήματα ἐχόντων διεφθείροντο.*²⁰⁵

The sharp spines are so characteristic of the fish, that the term *murex* was applied to many sharp objects. It is commonly used to denote jagged and dangerous rocks: *Murices petrae in litore similes muricibus vivis, acutissimae et navibus perniciosae.*²⁰⁶

²⁰³ Greenough and Kittredge, *Words and their Ways in English Speech*, p. 367.

²⁰⁴ Veg. iii, 24. The Latin term *murex* is used by Curt. iv, 13, 36, and by Val. Max. iii, 7, 2.

²⁰⁵ Polyænus i, 39, 2.

²⁰⁶ Isid. *Orig.* xvi, 3, 3.

Pliny informs us that Cato, in order to prevent the assembling of the people in the Forum, decreed that it be strewn with *murices*, probably sharp stones: *mutatis moribus Catonis Censorii qui sternendum quoque forum muricibus censuerat*.²⁰⁷ These *murices* may be forerunners of the military *murices*.

With an emphasis of such character placed upon the sharp points, the transition is very easy to the military *murex*, the prominent feature of which is the sharp spine-like shaft.

The *murex* was used also as a means of torture for prisoners. The Romans, according to the traditional story, retaliated for the cruelty to Regulus by confining Carthaginian captives in a box bristling with *murices*, 'spikes.'

Tuditanus somno diu (Regulum) prohibitum atque ita vita privatum refert, idque ubi Romae cognitum est, nobilissimos Poenorum captivos liberis Reguli a senatu deditos et ab his in armario muricibus praefixo destitutos eodemque insomnia cruciatos interisse.²⁰⁸

In English military parlance the expression *crows' feet* is used at times to denote the caltrop.

ASPIS, GK. ἀσπίς, AN ASP; *transf.*, A SHIELD.

To Justinian we are indebted for an instance of the use in Latin of the word *aspis*, meaning shield: *Prohibemus privatos fabricari et vendere arcus, sagittas; aspidas insuper sive scutaria*.²⁰⁹

The *Thesaurus* of Stephanus and the *Dictionary* of Liddell and Scott unite with the Auctor *Etymologici Magni* in giving precedence to the second meaning. Saalfeld in his *Tensaurus Italograecus* and the *Thesaurus Ling. Lat.* adopt the reverse order. In Greek, ἀσπίς means shield in nearly every instance, while in the Latin *aspis* the order of frequency is the reverse.

The Auctor *E. M.* ascribes the change to the method of locomotion of the animal as it advances in a whirling coil

²⁰⁷ Plin. *Nat.* xix, 1, 6, (24).

²⁰⁸ Gell. vii, (vi), 4, 4.

²⁰⁹ *Novell. Iust.* 86, 4.

and not elongated. It is a figure drawn from the weapon, for the serpent is accustomed to fight with its body coiled.

ἀσπίς . . . ἐπὶ τοῦ ἔρπετοῦ, διὰ τὸ κύκλους ποιεῖν τοῦ σώματος καὶ μὴ ταχέως ἐκτείνειν εἰς μῆκος. ἀπὸ μεταφορᾶς τοῦ ὅπλου. οὕτω γὰρ συστρέφαν ἑαυτὸ πολεμεῖ καὶ μάχεται.

Whether the transfer be from *asp* to *shield* or vice-versa, it seems probable that the real basis of the change is the one assigned. There has always existed a large mass of popular fiction and superstition with regard to snakes, and it is not too much to suppose that this belief in the alleged shape of the asp when making its attack was sufficiently widespread to effect the change in meaning. The general appearance of the asp would then be circular and convex, which is the shape of the ἀσπίς (clipeus) when the term is accurately used.

To effect such a transfer it would not be necessary for people to see the asp perform *in propria persona*, since free rein is given to the imagination in snake lore. A harmless snake of the southern part of the United States has ascribed to it a method of locomotion which is entirely foreign to it, and so gets the name *Hoop Snake*, "from the mistaken notion that it curves itself into a hoop, taking its tail in its mouth and rolling along with great velocity."²¹⁰

Likewise "Southern children believe that a coachwhip-snake is able to roll rapidly along the ground in the form of a hoop, and in this manner it will pursue a defenseless child and whip it to death."²¹¹

The scholiast on Aristophanes, though differing with the Auctor *E. M.* in the order of the transfer, also attributes the figure to the shape of the asp, but when it was coiled up in sleep. With a greater strain upon his imagination he may have likened the head of the sleeping serpent to the *umbo* of the shield:

δοκεῖ δέ μοι τὴν ἀσπίδα τὸ ὅπλον ἀπὸ τοῦ τοιούτου ὀνομάζεσθαι ζῶον, διὰ τὸ εἰς κύκλους πολλοὺς ἐλίσσόμενον καθεύδειν. κυκλικαὶ γὰρ ἦσαν αἱ ἀσπίδες τῶν παλαιῶν.²¹²

²¹⁰ Webster s. v. *hoop*.

²¹¹ *Encyclopaedia of Superstitions, Folklore and the Occult Sciences*, vol. ii, p. 696.

²¹² *In Vesp.* 18, Dübner.

While the second alternative does not account for the selection of the asp rather than some other species of the snake family, still it gives additional assurance that the metaphor arises from the similarity in shape.

SCORPIO, GK. *σκορπίος*, A SCORPION: *transf.*, 1, AN INSTRUMENT PRIMARILY FOR SHOOTING ARROWS; 2, AN ARROW; 3, A KIND OF BALLISTA.

In striving to account for this transfer of meaning, Tertullian has led us into a bewildering labyrinth of comparisons that seems *irremeabile*. He finds numerous likenesses in the general complexity of both animal and machine, in the source of the danger, in the contour of the frontal claws of the animal and the shape of the bow, in the method of attack, and in the dangerous point of the sting and of the arrow:

Scorpii series illa nodorum, venenata intrinsecus venula subtilis, arcuato impetu insurgens, hamatile spiculum in summo tormenti ratione restringens; unde (i. e. from all of these points) et bellicam machinam, retractu tela vegetantem, de *scorpio* nominant.²¹³

There is no suggestion of the naïve in Tertullian's explanation. It is a conscious endeavor to find points of resemblance.

Heron has found the cause of the transfer in the general shape of the scorpion, *εὐθύτονα*. ἃ τινες καὶ σκορπίους καλοῦσιν ἀπὸ τῆς περὶ τὸ σχῆμα ὁμοιότητος;²¹⁴ but this explanation is too indefinite in its character to be satisfactory.

When we recall that the term *scorpio* is applied to a prickly sea-fish, an aculeated plant, a sharp-pointed instrument of torture, a tapering boundary stone, etc., we can safely conclude that Vegetius is correct in attributing the figure to the sting itself (and not to the stinging):

Scorpiones dicebant, quas nunc manuballistas vocant, ideo sic nuncupati, quod parvis subtilibusque spiculis in-

²¹³ Tert. *Scorp.* i, 4-7.

²¹⁴ Math. Vett. p. 122.

ferunt mortem.²¹⁵ That is, not, 'because they cause death,' but, 'because they use small delicate points as an instrument of death.'

The Greek technical name for the machine, *καταπέλται ὀξυβελεῖς*, 'sharp-missiled catapults,' supports the derivation of Vegetius, since the weapon of the catapult is primarily the arrow. In fact, *ὀξυβελεῖς*, emphasizing the point, is directly in line with the tradition of the sagas which furnish clues for the explanation of the effectiveness of ancient Greek archery. "There is no doubt whatever that the primitive inhabitants of Greece poisoned their arrow-heads. The very word for poison, *τοξικόν*, means 'belonging to an arrow.' And many myths tell of the incurable and burning pains caused by arrows. The arrows of Heracles in Hesiod (*Aspis*, 132) 'had on the front of them death and trickling drops.'"²¹⁶

The prominence of the erect tail, together with the general shape of the body, and the belief in the deadly results of the sting, ensured the selection of the *scorpio* for the transfer instead of the bee, whose *aculeus* makes men yell: *apis aculeum sine clamore ferre non possumus*.²¹⁷

The metaphor in *scorpio* did not always proceed *laxis habenis*. Isidore is quite explicit on the subject, informing us that the term may be applied to the arrow alone, whether it is discharged from the bow or from the catapult: *Scorpio est sagitta venenata arcu vel tormentis excussa, quae dum ad hominem venerit, virus, qua figit, infundit; unde et scorpio nomen accipit*.²¹⁸

While the transfer is assigned in this passage to the stinging rather than the stinger, we can again account for the statement through a confusion between cause and effect.

In later times the term *scorpio* became synonymous with *onager*: *Scorpionis quem appellant nunc onagrum*...²¹⁹

In this instance, the similarity is between the erect caudal

²¹⁵ Veg. iv, 22.

²¹⁶ Murray, *The Rise of the Greek Epic*, p. 120.

²¹⁷ Cic. *Tusc.* ii, 22.

²¹⁸ Isid. *Orig.* xviii, 8, 4.

²¹⁹ Amm. xxiii, 4, 4.

appendage and the threatening arm of the machine. Scorpio (appellatur) quoniam aculeum desuper habet erectum.²²⁰

Between no other animal and machine are there so many points of similarity, real or incidental. A description of one would almost fit the other:

ANIMAL.	MACHINE.
aculeus	aculeus
acumen	acumen
spiculum	spiculum
ictus	ictus
figere	figere
venena diffundere ²²¹	virus infundere ²²¹
venenum infundere	
arcuato impetu insurgens	retractu tela vegetans.
intrinsicus venula subtilis	σωλήν
tenui fistula perforati	fistula . . . patula tenuitate
venenata venula	sagitta venenata
eum interficere demonstratur	inferre mortem

Chele (Gk. *χηλή*), properly the claws of a scorpion or crab, is transferred to the claw-shaped trigger of the machine.

That the Romans had a wholesome respect for the scorpion, is shown by Ovid's vivid picture of its erect menacing tail: *elatae metuendus acumine caudae scorpior.*²²²

The belief in the deadly effect of its venom is revealed by the tradition that Orion, the Nimrod of Classic Mythology, was killed by a scorpion: Orion, cum venaretur et in eo exercitatissimum se esse confideret, dixisse etiam Dianae et Latonae se omnia quae ex terra oriuntur, interficere valere: quare terram permotam, scorpionem misisse, qui eum interficere demonstratur.²²³

That the scorpion impressed its individuality upon the Greeks, is attested by numerous proverbs.

²²⁰ Amm. xxiii, 4, 7.

²²¹ This word recalls the derivation from *σκορπίζω*.

²²² Ov. *Fast.* iv, 163.

²²³ Hyg. *Astr.* ii, 26.

'To act the scorpion,' as Hesychius tells us, denotes bestial anger. σκορπίωσαι ὡς θηρίον τραχύνον, ὀργίζου.

σκορπίον ὀκτάπουν ἐγείρεις reminds one of the English expression, 'You're stirring up a hornets' nest.'

ὑπὸ παντὶ λίθῳ, becomes proverbial for danger. Sophocles makes excellent use of the figure in the *Captives*.

ἐν παντὶ γάρ τοι σκορπίος φρουρεῖ λίθῳ.²²⁴ 'Under every stone, I tell you, a scorpion lurks.'

σκορπίος ζητῶν ὅτῳ ἐγχρίμψαι τὸ κέντρον,²²⁵ recalls the Biblical lion seeking whom he may devour.

CHELONIUM, GK. χελώνιον, A TORTOISE SHELL;
transf., A PART OF THE SCORPION, APPARENTLY
 THE HOOK, AXLE, AND FRAME.

Heron has given the reason for this name, ascribing it to the general contour of the appliances as they rise from the body of the machine: ἐκάλουν τὸ μέρος τοῦ ἐπικειμένου κανόνος χελώνιον. ἦν γὰρ καὶ ὑψηλότερον τοῦ ἐπικειμένου κανόνος.²²⁶

Commenting on this passage, the scholiast confirms the words of Heron: Chelonium Graece χελώνιον. Quid sit proprie in catapulta chelonium, ex hoc loco manifeste patet, ratio enim vocabuli apponitur, ait enim Heron, vel potius innuit, ideo dictum, quod superet sua eminentia summam superficiem summae regulae; erat enim instar testudinei dorsi elatum.²²⁷

Figurative uses of the Greek and Latin words for *back* are rather common. Commenting on Verg. *Aen.* i, 110, Servius cites Homer's νῶτα θαλάσσης. He adds that *dorsum* 'reef' immediately following *aras*, is quite in keeping, since in Greek altars are called *horses' backs*: Dorsum autem hoc loco non absurde ait, quia Graece arae ipsae ἵππου νῶτα dicuntur, ut Sinius Capito tradidit; secundum Homerum.

In English, the *turtleback* or *whaleback*, is "an arched protection erected over the upper deck of a steamer at the bow, and often at the stern also, to guard against damage

²²⁴ Soph. fr. 34 (Campbell).

²²⁶ Poll. vi, 125.

²²⁵ Math. Vett. p. 124.

²²⁷ Id. p. 332.

from the breaking on board of heavy seas." By synecdoche the terms are then applied to the entire vessel.

In baseball circles the *turtleback* diamond has made its advent in recent years.

LUPUS, GK. λύκος, A WOLF; *transf.*, A JAW-SHAPED DEVICE FOR SEIZING THE ARIES,²²⁸ OR EVEN MEN.

An instance of the military use of this word is found in a passage where Livy tells of *iron wolves* threatening to carry besiegers aloft within the walls: in alios lupi superne ferrei iniecti, ut in periculo essent, ne suspensi in murum extraherentur.²²⁹

Comparing this wolf with the one employed to recover articles from the bottom of a well, one might suppose the transfer to lie in the physical act of seizing: *Lupus* qui est *canicula*, ferreus harpax, quia si quid in puteum decidit, rapit et extrahit, unde et nomen accipit.²³⁰

An indication of the real reason for the name can be obtained from the description of Vegetius, who lays stress on the shape of the gripping apparatus, which resembles a pair of shears and is equipped with teeth: Plures in modum forcis dentatum funibus inligant ferrum, quem lupum vocant, adprehensumque arietem aut evertunt aut ita suspendunt ut impetum non habet feriendi.²³¹

Further confirmation of the view that it is the shape of the jaws, and not their action, that causes the transfer is found in *lupus*, a bit with wolf-like teeth, and in *lupus*, a handsaw. The power to grip and seize is a result of the shape. As in other instances, a confusion has arisen between cause and effect. In English a close analogy is found in the seventeen uses of *dog*, "a name given to various mechanical devices, usually having or consisting of a tooth or claw used for gripping or holding."²³²

²²⁸ This recalls the proverbial antipathy between the wolf and the sheep.

²²⁹ Liv. xxviii, 3, 7.

²³⁰ Isid. Orig. xx, 15, 4.

²³¹ Veg. iv, 23.

²³² Murray, *New Eng. Dict.* s. v. *dog*.

The proverbial *rapacitas* of the wolf,²³³ which is responsible for *lupus*, a voracious fish or person, facilitates the selection of the word *wolf* to denote the device which works with results so similar.

In Procopius there is described a λύκος, 'wolf,' which, though more complex than the Roman device, operated with wonderful precision and accuracy.²³⁴ Like *onager* (see p. 40), it is an instance of Greek indebtedness to Latin for an animal name to designate a military machine.

Wolves of various types were employed during the middle ages:

Lupus Belli appellatur a Matth. Westmonaster. ann. 1304: Iussit rex arietem fabricari, quem Graeci Nicontam vocant, quasi vincentem omnia, et Lupum belli. Verum aries indecens et incompositus parum aut nihil profuit: Lupus autem belli, minus sumptuosus inclusis plus nocuit.

Lupus, nude, in Chronico Estiensi apud Murator. tom. 15, col. 359: Unum maximum Lupum cum quo capiebat fortilitias domini Marchionis.

Loupus. Mandatum Ricardi 11. Regis Angl. ann. 1394: Necnon ad quoscumque defectus, tam in muris, portis, turellis, Loupis, pontibus, barreris et fossatis, quam in domibus.²³⁵

CUNICULUS, A RABBIT; *transf.*, A TUNNEL EMPLOYED IN SIEGE OPERATIONS.

The transferred application of *cuniculus* for an underground passage was a very broad one, including even aqueducts. The term was, however, used most frequently in its military signification. Among a warlike people this was very natural. As a nation, the Romans were in their early days more familiar with siege tactics than with mining operations.

²³³ Ael. N. A. xi, 37, has classified the wolf, dog, lion, and panther by the term *καρχαρόδοντα*, animals with teeth dove-tailed, so to speak, and hence adapted for seizing. Of the first two animals, which are the more familiar ones, the Latin chose *wolf* for the figurative use, the English selected *dog*.

²³⁴ Procop. B. G. 21, 19 sq.

²³⁵ Quoted by Du Cange, s. v. *Lupus*.

In spite of the statement of Varro²³⁶ and Pliny,²³⁷ *cuniculus*, 'an underground passage,' is derived from the name of an animal and not vice versa.

Paulus gives the real sequence of the transfer in the first of his explanations, though the second is an etymological absurdity: *Cuniculum, id est foramen sub terra occultum, aut ab animali, quod simile est lepori, appellatur, cui subterfossa terra latere est solitum, aut a cuneorum similitudine qui omnem materiam intrant fidentes.*²³⁸

Vegetius, however, displays no hesitancy in his derivation, rightly ascribing the transfer to the animal's habit of burrowing: *Genus oppugnationum est subterraneum atque secretum, quod cuniculum vocant a leporibus, qui cavernas sub terris fodiunt ibique conduntur.*

While the burrowing causes the transfer, an intermediate step must have been the application of the term *cuniculus* to the results of the animal's excavating propensities, i. e. to the burrow.

A figure somewhat similar to that in *cuniculus* is found in *talpa*, the mole, or digger: *Talpa. Machina ad suffodiendos muros, sub qua latent, qui cuniculos conficiunt.*²⁴⁰

The *cunicularii* of earlier days are recalled by the *talparii*: *Habebat quippe quosdam artifices, quos Fossores vel Talparios vocant, qui ad modum talpae subterranea fodientes, quaslibet murorum et turrium firmitates ferramentis validissimis perrumpebant.*²⁴¹

The popular belief in the burrowing ability of the rabbit is shown by Pliny's statement, on Varro's authority, that the *cuniculi* undermined a town in Spain.²⁴² *M. Varro auctor est a cuniculis suffosum in Hispania oppidum.*

Martial has a clever distich playing upon the two uses of the word *cuniculus*:

*Gaudet in effossis habitare cuniculus antris.
Monstravit tacitas hostibus ille vias.*²⁴³

²³⁶ Varro *Rust.* iii, 12, 6.

²³⁷ Plin. *Nat.* viii, 55, 81, (218).

²⁴⁰ Du Cange, s. v. *Talpa*.

²⁴¹ Quoted by Du Cange, s. v. *Talparii*.

²⁴² Plin. *Nat.* viii, 29, 43, (104).

²⁴³ Mart. xiii, 60.

²³⁸ Paul. Fest. p. 50 Müll.

²³⁹ Veg. iv, 24.

TIGRIS, IN PERSIAN, AN ARROW; IN LAT., A TIGER.

An interesting instance of the opposite phenomenon, the name of a weapon giving rise to the name of an animal, is seen in the Latin *tigris*. The word goes back ultimately, through the Greek *τύρις*, to the Persian, where, as Varro says, it was applied to an arrow or a very swift stream: *Tigris qui est ut leo varius, qui vivus capi adhuc non potuit; vocabulum e lingua Armenia; nam ibi et sagitta et quod vehementissimum flumen dicitur Tigris.*²⁴⁴

Pliny has a few words of the same tenor as Varro's: a celeritate Tigris incipit vocari; ita appellant Medi sagittam.²⁴⁵

MULI, MULES: MULI MARIANI: 1, DEVICES USED BY SOLDIERS OF MARIUS FOR CARRYING BAGGAGE; 2, THE SOLDIERS WHO CARRIED THEIR OWN BAGGAGE.

While the expression *Muli Mariani* was applied to the soldiers of Marius, as Plutarch shows,²⁴⁶ there seems to be no doubt that the expression signified originally a forked device over which the baggage dangled in a manner suggesting the legs of a horseman astride his mount. Festus speaks as follows: *Muli Mariani dici solent a Mario instituti, cuius milites in furca interposita tabella varicosius onera supportare assuerant.*²⁴⁷

From the same source we have a more definite statement that it was the *furcillae* that were called *Muli Mariani*: *Aerumnulas Plautus refert furcillas, quibus religatas sarcinas viatores gerebant. Quarum usum quia Gaius Marius rettulit, Muli Mariani postea appellabantur.*²⁴⁸

The secondary transfer of meaning from the instrument to the soldier is very easy and natural, in fact inevitable. *Varicose*²⁴⁹ 'astraddle' shows that the change in significa-

²⁴⁴ Varro *Ling.* v, 100. Saalfeld in *Tensaurus Italograecus* derives the second meaning from the first: 'Tigris, der von seinem pfeilschnellen (cf. celeris . . . sagittas, Verg. *Aen.* i, 187) Laufe benannte Tigerfluss.'

²⁴⁵ Plin. *Nat.* vi, 27, 31, (127).

²⁴⁶ Plut. *Mar.* 13.

²⁴⁷ Paul. Fest. p. 148 Müll.

²⁴⁸ Ib. p. 24.

²⁴⁹ It seems best to connect *varicose* with *varicus* 'straddling,' rather than with *varicosus* 'varicose.'

tion is due to the burden rather than the supporting object. The figurative use arises then from the general resemblance between the pendent baggage and a rider astride his animal.

If one may judge from the animal names (or derivatives from them) included under *Machinae Bellicae* in Du Cange,²⁵⁰ a siege during the Middle Ages might have suggested a zoological garden. The list is as follows:

Aries ²⁵¹	Musclus
Asellus	Onager
Berbices	Panthera
Cancer	Scrophæ
Catus	Spingarda ²⁵²
Colobrina	Spingardella
Ericius	Sus
Falconeta	Talpa
Gatta	Talparii
Hirundo	Turturela
Locusta	Vulpes
Lupus	Vulpecula ²⁵¹
Moschetta	

²⁵⁰ Du Cange, Tom. vii, p. 515.

²⁵¹ Not listed, but referred to under *lupus* and *vulpes* respectively.

²⁵² Vocis etymon a Germ. *Sprintz*, quod muscetam, genus accipitrum, significat, deducit Ferrarius. Du Cange s. v. *spingarda*.

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²⁵³ Not captions.

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